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KERAK—VESTIBULE OF HOUSE

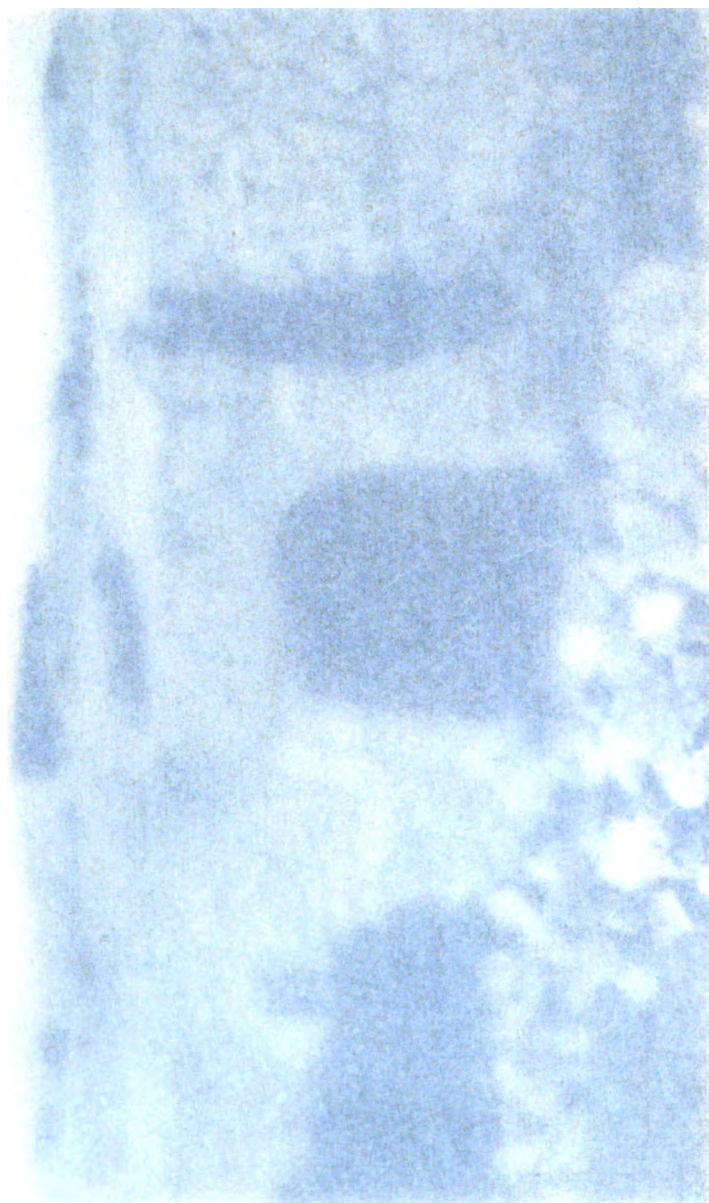
Frontispiece

THE UNIVERSITY OF CHICAGO

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The Jordan Valley and Petra

By

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and

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Syria Mission, Beirut, Syria

With 159 Illustrations

Two Volumes

II

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The Jordan Valley and Petra

THE JORDAN VALLEY AND PETRA

CHAPTER I

KERAK TO SHOBEK

THE journey from Kerak to Petra is sometimes made in three long and hard days. Those who must rush through in this fashion lose much that is worth seeing, and severely test the strength and endurance of men and animals. So here again we departed from the usual plan, and transformed a most difficult stage of the journey into a delightful ride. We broke the journey from Kerak to Tafleh into two stages, and spent a night again in the wilderness. We did the same between Tafleh and Shobek, and would most heartily recommend this plan to all who may follow us in the short winter days. It involves only the carrying of extra barley for the animals and charcoal for cooking purposes. There is an abundance of water and good camping-places. Our

VOL. II.—I.

I

2 The Jordan Valley and Petra

riding time between Kerak and Tafleh was five and a half hours one day, and four and a half the next, or ten hours in all. But our muleteers required seven and six hours, or thirteen hours in all, which would have been an impossibility for any winter day, and cruelty to men and animals in the heat and drought of summer. From Tafleh to Ain el Gelaidat, we took four hours, and on to Shobek in five hours, but our muleteers required five and six and a half hours respectively, or nearly twelve hours in all. To journey thirteen hours one day, with muleteers and camping outfit, and twelve the next, not mentioning the time and labor required to take down and set up the tents, is not pleasure, but unnecessary hardship and even cruelty. The stage from Shobek to the Sik, or entrance to Petra, can be made easily by the muleteers in six and a half hours, and therefore with comfort. A large part of the difficulties and dangers encountered by travellers in such regions arises from their attempting to do too much, or to do the impossible.

Mules and muleteers can do very hard work, and stand much hardship, if only they can have food and rest and be treated fairly. But when driven beyond their strength, the men lose their tempers, the mules get sore backs, and if cold and rainy weather or the pangs of thirst are added, camp life loses all its charms. The pleasures of a whole journey may be dissipated by the attempt to save or gain a day at the wrong place. And those who elect, as we did, to take muleteers into a country



KERAK VALLEY FROM THE SOUTH

where only camels are supposed to live, must make due allowance, in time and the weight of the loads. When they do this, they can expect to enjoy travelling in this extremely barren region. Otherwise they had better remain in the beaten tracks west of the Jordan.

Among the remarkable features of the road between Kerak and Petra is the matter of the elevations and depressions. Our tents in Kerak were at an elevation of three thousand four hundred feet, and in Petra itself about three thousand feet, but we dipped once to seventeen hundred and fifty feet, and climbed twice to five thousand six hundred and five thousand eight hundred feet, with half a dozen smaller variations. A glance at the diagram, Vol. I., p. 35, will explain better than many words can our experiences along this line.

Here again we noticed a great increase in the number and thickness of the layers of flint. Portions of the side walls of these canyons exposed surfaces where there was a sheer precipice of from eight hundred to a thousand feet, much of which was solid flint. The layers varied from one to fifty feet in thickness, and in one instance a single layer exceeded a hundred feet in thickness. All of the darker portion of the rock shown in the photograph on page 9 is composed of flint. This mass is to be found almost in the bottom of the canyon of the Ahsa, and on its northern side. We named it Flint Mountain.

In portions of the bottom of the gorge, where lateral or tributary streams enter, we found that

6 The Jordan Valley and Petra

where the stream had reached a flint layer that it apparently could not manage, it flowed over this polished bed, leaving a surface like glass, and which glistened like the reflecting surface of water, when seen from a distance. When the stream reached the edge of the stratum bordering on the main valley, it dropped over the solid cliff, and began the process of undermining. The underlying limestone was more easily acted upon, and when a sufficient quantity had been removed, the weight of the stratum of flint was all that was needed to break the layer down of itself. Great quantities of such boulders were found near the mouth of such tributary streams, and in this slow manner the waters were eroding their bed back into the main mass of the rock.

Everywhere traces could be found of the existence of intense heat sometime in the past, as shown in the fusion of the rocks, but there were no signs of lava.

We left Kerak at 8 A.M., by passing through the breach in the southern wall, just west of the great castle, and in twenty minutes had dropped into the narrow valley. We paused several times to enjoy the wonderful view of the castle and city wall behind us (see photograph, Kerak Seen from South). The ramp of the castle at the point where the hill hides it was fully one hundred and fifty feet high, which, with more than one hundred feet of the tower, makes an unbroken wall of two hundred and fifty feet still standing.

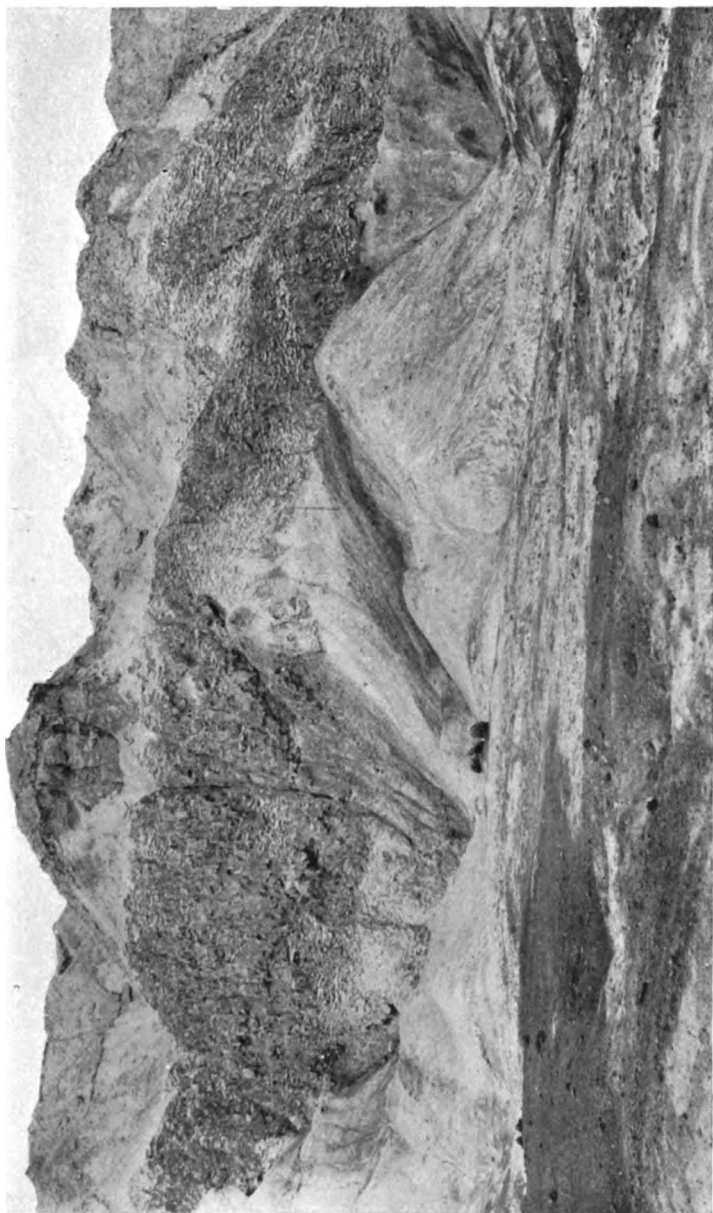
During the ride of four hours, we reckoned that we had seen at least thirty ruins of towns and villages, and many signs of the industry of former generations. At 11 A.M., we had climbed again to forty-three hundred and fifty feet, and stood on the brink of the Wady el Hessi or el Ahsa. Then within two hours we had dropped twenty-seven hundred feet, and found the descent rather harder for the animals than the descent to the Arnon. Half-way down we passed a rather extensive ruin called Abdy, which from its location might have been a small fort or guard-house. The road is easily found by following the telegraph poles.

Wady el Hessi is one of those valleys which boasts more than one name. Some write it Hissa, but we heard "el Ahsa" more frequently than any other form. It is called also "Wady el Sid-diyeh," "Seil Ghoraby," and in its lower course "Wady el Kurahi." It forms the southern boundary of the district of Kerak. In ancient times it was the boundary between Moab and Edom (Deut. ii., 13, 14; Num. xxi., 12). Like the Arnon it is not one valley but several, and the various names for the branches have occasioned confusion. At times one of the names is applied to all the system, and at another each branch seems to have a separate name. The valley, where we crossed it, differed from the Arnon in having a level floor, not less than two hundred yards wide. Toward the west the sides closed in, but are not nearly so precipitous as those of the Arnon. Toward the east the valley

8 The Jordan Valley and Petra

divided, and from a distance it looked as though most of the smaller valleys would be passable. A fringe of oleanders, reeds, and scrubby trees, in places one hundred yards wide, lined the stream where we camped, and our animals enjoyed picking at the herbage among the bushes. We walked up and down the valley, but did not see a sign of any living being, though we suspected the existence of wild boars, and had heard that among the cliffs toward the Dead Sea leopards had frequently been shot. We amused ourselves by kindling fires along the stream and when the reeds, twenty to thirty feet high, began to burn fiercely, there was a continuous series of reports like those of a small cannon. We watched and hoped for a sight of a startled boar, but failed to see one. Nothing could exceed the stillness and loneliness of this spot. But while we saw no sign of any living creature, we did not fail to set a sharp watch on our animals all night long, and to wake the echoes by volleys from our guns at intervals. Arabs who steal horses and mules will follow a caravan for days, waiting for the chance to get away with an animal.

It was delightful sleeping in this wild spot, but before morning we had a taste of the winds which sweep up such canyons, and found our tents rocking and lurching about in a manner that made us hasten to get into our clothing. Before we had swallowed breakfast, things were flapping at a great rate, and it required the help of every hand in camp to get the tents down and rolled into their



AHSA CANYON—FLINT MOUNTAIN

coverings. By the time we had packed up, big rain-drops began to fall, and we made preparation for facing the storm, which threatened to break in violence. Our road out of the valley, after crossing the stream, struck up a flint-floored canyon where the rock was worn as smooth as shining brass. The strokes of ten thousand hoofs beating upon it for thousands of years have not made so much as a foothold into this stratum, which ascends at an easy grade for miles. Here and there occurs a change from one stratum of flint to another, where a cliff-like wall threatens to end all farther progress, and the road has been carried with great difficulty round the debris on either side.

Our barometers gave the floor of the valley an elevation of sixteen hundred and fifty feet. In half an hour we had climbed to twenty-one hundred; then made a descent of about three hundred feet. After that there came a steady climb of two hours until the needles of our barometers stood at forty-two hundred feet again. A little later they dropped to four thousand feet, and kept at that elevation until we came into sight of Tafeleh.

At one point on the road, about an hour south of the Ahsa, we saw ten huge heaps of stones, piled up irregularly along the road. A few years ago some Arabs swooped in from the desert, stole cattle from the Kerak people, and were escaping along this road with their plunder. The Kerakese followed, and came up with the Arabs at this spot. A free fight followed, in which six of the Arabs

were shot dead and four wounded. Afterwards the Arabs raised a heap of stones to mark each of the ten pools of blood. We were unable to find out whether the feud or account was still open, but no Arab of that particular tribe will pass there without adding an oath and a stone to the heaps already so prominent.

But what will make this day's ride a memorable one was the howling storm which broke upon us as we climbed the southern slope of the valley. Many a time we thought of the saying, current in Moab, "O Lord, do not listen to the prayers of the travellers!" Travellers are always supposed to ask for fair weather, and if we called for fair weather that day the prayers of the people prevailed and the heavens gathered for a storm. We foresaw its coming, and got out our heaviest clothing and rubber coats. It came from the west and south, and proved to be one of the most pitiless we ever faced. Half an hour away from camp, as we climbed over a small ridge, it struck us fairly in the face. Our horses quailed before it, and struggled up the steep road. We buttoned our clothing tighter and made light of it. But the higher we climbed the fiercer it blew, and at many a turn it seemed as though both we and our horses would be carried bodily over the precipices or down the rough slopes.

Most of a man's clothing buttons over from left to right, and we never saw the great disadvantage of this before. The fierce wind lifted one fold after



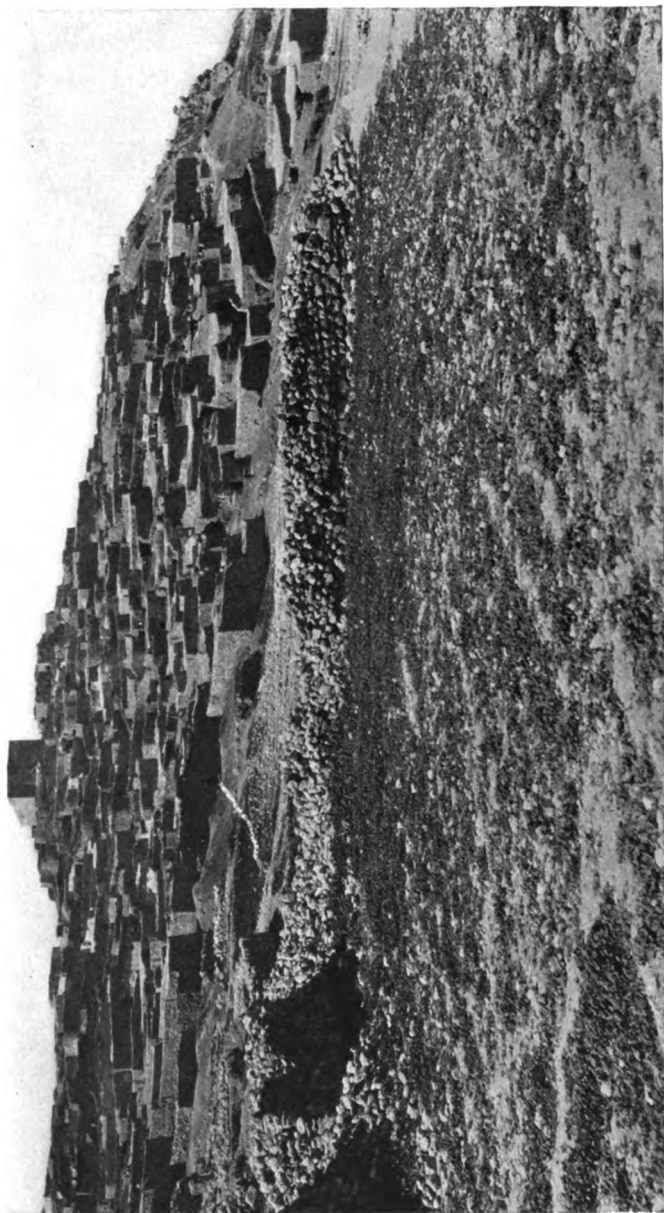
AHSA CANYON—FLINT BED OF TRIBUTARY STREAM

another of clothing, and the cold rain beat in at every crevice, until it seemed almost madness to push on. But there was nothing else to do. And so for over four hours, more than half of which was along the mountain ridge at an elevation of four thousand feet, we pushed against the howling storm until the last drop in the road brought us below the ridge and in sight of Tafeleh. Half an hour later we were sheltered inside the half-built government building, beating our chests and kicking our legs out to rouse a little warmth within. We were soaked to the skin around our necks and high up above our knees. Our big overcoats were completely waterlogged and weighed not less than forty pounds! The building was without doors or windows and the winds swept through it with violence. Our muleteers while on the trail at times had to hide below the rocks, and were two hours behind us. Just as they came toiling round the shoulder of the mountain towards the town, the howling winds slackened up and the sun broke through the clouds, giving us an hour or two in which to set up our camp among the olive trees. We dug around the tents and Milhem brought a huge sack of chaff which we spread inside and around the tents, and saved our baggage from being dumped into the mud. Barring our wet clothing we managed to make ourselves fairly comfortable. The thermometer dropped to 51°, and the wind and rain kept up most of the night. The storm proved to be so violent that our men

sought shelter for their animals and themselves in the town. After some bargaining as usual, they rented a house which would take them all in for eleven cents, and were happy.

This wind was most peculiar in some of its features. It died out about sunset but sprang up again about ten o'clock at night and continued to increase in violence until the morning, when it amounted to a gale. It is quite doubtful whether our tents would have stood this searching test of their strength if we had not pitched them in an olive grove, which gave us considerable shelter.

Our position gave us a clue to the cause of this disturbance. Looking directly down the valley in front of our tents we could see the Dead Sea, and the wind followed that line directly, as though it were a great chimney, to relieve the pressure upon the surface of that body of water. This may afford an explanation of those sudden and terrific gales which descend upon the Dead Sea. The overheated eastern plateau starts an ascending current, and the numerous canyons which cut through the great eastern boundary of the Sea afford an excellent channel to start "a draft," as it were, from below, and this in its turn brings about serious consequences upon the Sea when the equilibrium of the atmosphere is upset. It is thus easy to see why it is that a moderate storm is almost an impossibility in this region. The phenomenal atmospheric pressures developed in the depression of the Ghor, and



TAFILEH

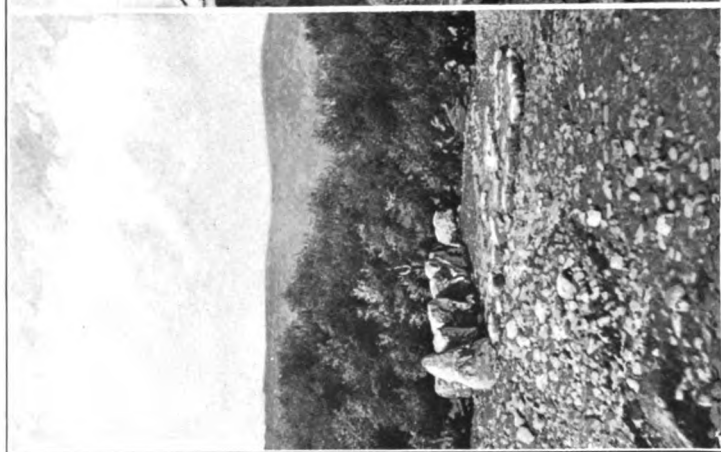
the ease with which they can be disturbed, are a constant menace to peace and quiet, thus making the Dead Sea a species of perpetual "storm centre."

Tafileh is one of the *hapax legomena* of the Bible. It is mentioned as "Tophel" in Deut. i., 1, and never appears again. That it was an important place in Crusader days is evidenced by the large fortified tower which still stands on the highest point of the knoll, and is occupied by a garrison of two hundred Turkish soldiers. It is a large village of seven hundred houses. The inhabitants are nearly all in the middle stage, between dwellers in tents and dwellers in cities. On our return some ten days later we saw them getting out their hair tents, mending and repairing them preparatory to taking to the nomad life for the summer months. The town is beautifully situated on the side of a hill, with a well-watered and well-cultivated valley below it. There are no less than eight springs in and around the village. The one on the main road with a small Moslem prayer platform beside it is esteemed the best drinking water. The olive groves, vineyards, and fig orchards are like an oasis in the desert. Kerak on the inside is a dust and rubbish heap, but Tafileh is a beautiful little garden town. The view from the top of its castle over the Dead Sea is of exceptional beauty and interest. That quiet water surface seemed well within the reach of a rifle ball although it was five thousand feet below us; but, as we found out later, it required more

than fourteen hours to reach it, down a terrible road.

We had expected to find a friend in Tafleleh to whom we carried special letters from Beirut, Abd el Ghanny Pasha, an enlightened man from an old Beirut family. As a young man he acted as "yawar" or aide-de-camp to the Sultan Abd el Aziz prior to the latter's death in 1876, and has served the Turkish government in some capacity ever since. Evidences of his activity as Pasha of Tafleleh, and desire to improve the country, appeared in the repairing of the roads all round the town. A new mosque had been built and occupied, a telegraph office and the new government building were fast approaching completion. He aided Rasheed Pasha in building the great school building at Kerak, and in stretching the telegraph wires to Mecca and Medina. We were sorry to miss seeing him, but the judge and the telegraph operator did all they could to make our stay pleasant.

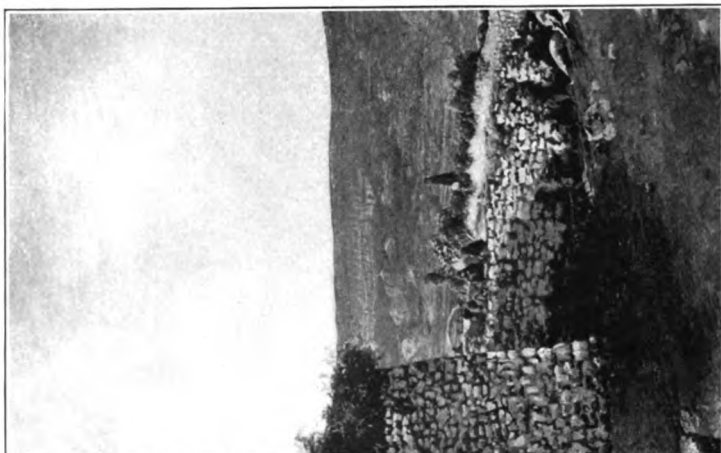
Next day we left Tafleleh (thirty-six hundred and fifty feet) and crossing a ridge or two were soon moving along among well-watered fields at an elevation of forty-four hundred feet. At Ain el Beidah (one hour and forty minutes) a stream of clear water flows across the main road. For more than an hour we had Buseirah, the little Bozrah, in sight, as we wound round the deep ravines which cut it off on three sides from the main table-land. It has a strong natural position in this lawless region. It



Prayer Platform



TAFLEH
Fountain



Afternoon Tea

was an important town of Edom and is mentioned in Scripture under the name of Bozrah of Edom. There are many signs of extensive buildings all round the region, and an abundance of water.

Just east of Buseirah is a shrine called Neby Haudefeh, a rude stone building, around which are piled timbers and farming utensils, under the protection of the owner of the shrine. It is one of those strange places where the Moslems offer bloody offerings. The custom here is to carry the sheep to the roof, cut its throat above the doorway, and allow the blood to run down the walls. The blackened streaks and cakes of dried blood are visible from a distance.

At the brook beyond the Neby our barometers registered forty-one hundred and fifty feet, and during the course of the next hour we climbed an easy, grassy slope, until we reached a beautiful fountain called Ain el Gelaidat, at five thousand two hundred and fifty feet above the sea. Here we pitched our tents and allowed all the animals to graze until sunset. During the night the thermometer dropped to thirty-one degrees, and, while the wind was not very high, the muleteers found it almost too cold to sleep, and as a consequence were moving about long before the dawn. It was one of the most beautiful of all our camping-places and, though there were no places of great interest in sight, the outlook was exceedingly wide and exhilarating.

The sky had a rainy look in the early morning, but it soon cleared off cold, and the ride on to

Shobek was another delightful day in the wilderness. Half an hour beyond the camp, we looked down from fifty-six hundred feet upon the little village of Dana, once surrounded by forests of oak which are dwindling rapidly away. We enjoyed beautiful views of the Wady Dana a deep cleft below the town, whose precipitous sides rise from five hundred to one thousand feet at the angles of a railroad cutting, and extend for miles in a straight line out and down to the Arabah.

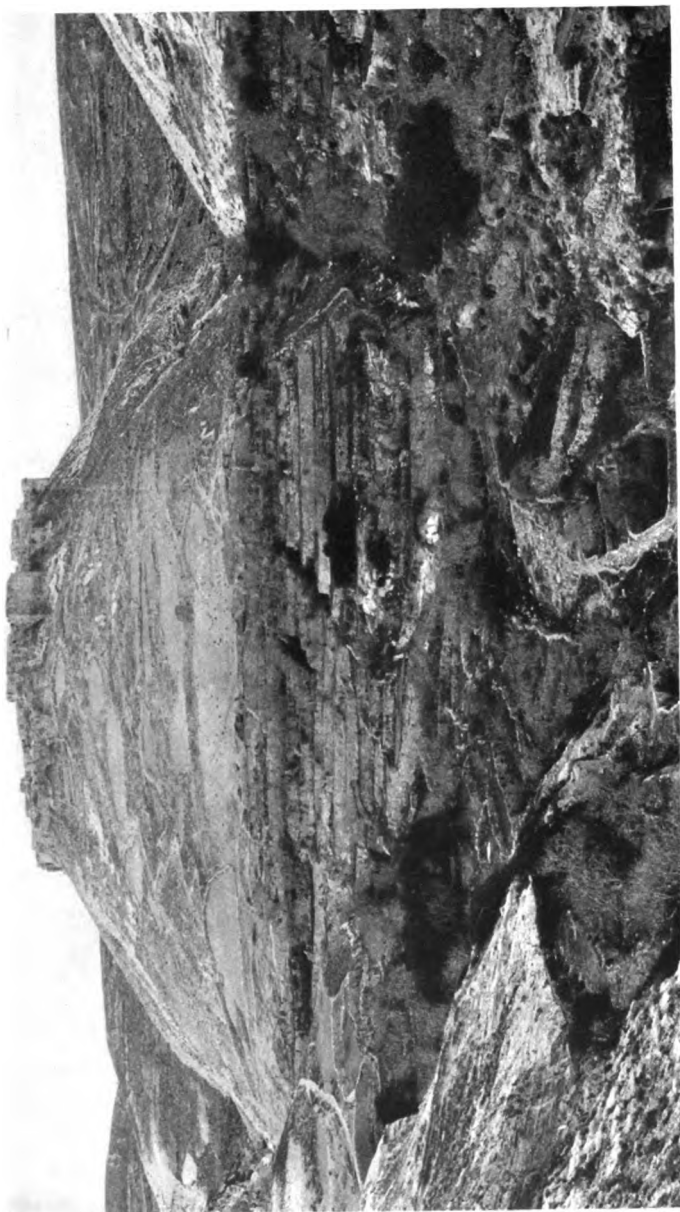
Beyond Dana we turned eastward, and catching again the wide curve of the ancient Roman road, we wound down the eastern slope, passing extensive ruins on a bluff, to the wide plateau. For two and a half hours we rode over this miniature desert, at an elevation of forty-six hundred feet, where nothing but sage-brush was to be seen for miles and miles, north, east, and south. Toward the west, we caught glimpses of the Arabah and the barren mountains beyond.

About 10 A.M. we sighted Shobek, off to the right, with an apparently unbroken plain between us and the castle. And here we bade farewell to our faithful guides—the telegraph poles and wires—which we had followed for nine days down the highlands. They swung off eastward to Maan and the caravan road to Mecca, while our road struck over the plain, straight toward the castle. Without much warning we suddenly found ourselves on the brink of a deep chasm, and began a sharp descent into what proved to be Wady

Shobek. In half an hour we had dropped to thirty-seven hundred and fifty feet in a perfect landslide of black basalt boulders. For more than an hour we wound along this valley, until we reached a fine grove of olive trees, not far from the base of the hill upon which stands the castle of Shobek—the Mons Regalis of the Crusades. It was built by Baldwin I., in a position of great natural strength, and within easy distance of the great caravan route between Cairo and Damascus. This fortress, with a single difficult entrance, standing as it does in an almost inaccessible location, must have been impregnable before the introduction of firearms. Nothing but starvation, with no hope of relief, could have forced any garrison to surrender. We know that Saladin made more than one desperate and fruitless attempt to capture it. Like the Kerakese, the people of Shobek have clung tenaciously to their semi-independence all through the centuries. It has, no doubt, changed hands many times, but the Arab tribe who possessed it have had a strong place to fall back upon, whenever pressed by an enemy. The Turkish government took this part of the country in 1893, and placed here a small garrison of mounted soldiers. In May, 1895, some trouble arose between the garrison and the people over the demands the soldiers made to have the women carry water from the valley below to water the soldiers' horses. The people drove out the soldiers, provisioned themselves, shut the gate, and defied the

government at Kerak. The Mutaserrif called upon them to surrender. They answered that while willing to pay all taxes imposed upon them, they would no longer admit any soldiers to dwell in the city. The government gathered some six hundred foot soldiers and one hundred cavalry, and, planting two cannon on a neighboring hill, laid siege to the place. Occasional skirmishes lasted for weeks. Then some Bedawin came to the relief of the besieged, but they were stampeded and put to flight by the cavalry and the band of military music! The soldiers bombarded the city for days, and we saw plainly where the walls and houses had been splashed with lead from the Martinis and shattered by the cannon balls. The government forces eventually took the city, after two hundred of the people and twenty of the soldiers had been killed, and at the time of our visit maintained a guard of eleven horsemen there.

We renamed the castle "the Mailed Fist," for, seen from almost every side, it is the most insolent and threatening fortress we ever saw. We pitched our tents by a small spring to the south, and then proceeded to ride up into the fortress itself. The northern slope of the hill is fully six hundred feet high, but from our camp to the city gate was a climb of three hundred feet. The road encircles two sides of the hill in its easy winds. The hill itself is of limestone, but with hundreds of plate-like strata of flint, standing at an angle of forty-five degrees, and looking very like great plates of steel.



SHOREK FROM EAST

After the Crusaders abandoned the place, some of the Moslems repaired it, and inserted great Arabic inscriptions like a frieze round the castle walls. The letters of these inscriptions are two and three feet in height, and extend for hundreds of feet unbroken. It is perhaps within the truth to say that nearly half a mile of inscriptions still exist. No doubt they express the joy and pride of those who fought so long and so savagely against the Crusade banners in these regions. The walls on all sides are very fine and the winding road is commanded by them at every foot of its ascent. The present gate is a breach among the ruins of a tower and is closed by a rude wooden wicket. Inside the wall is a confused mass of strong buildings, arches, vaults, stairways, with story above story of the present filthy dwellings. At one point are the remains of an enormous building with a tablet telling something of its history. There are also the ruins of a church of the Crusaders; in fact the old masonry seems to be entirely of Crusading origin, even though the site may well have been occupied by one of the dukes of Edom. The most curious feature of the city is a deep well among the ruins, with some three hundred and seventy-five steps leading down to the water. So that with food to eat the fortress could hold out indefinitely against an enemy. Several springs of water burst from the sides and base of the hill, and are led away to irrigate the gardens, which are in a state of great neglect though capable of being made valuable.

The present people have been accustomed to plough and sow only as far as a bullet would carry and protect a growing crop !

The view from the castle is fine and extends far over the plain to the north and east.

We met the sheikh of the place, whose name is Deeb (wolf), in the room of the Zabit, and the sight was a strange one. Deeb was a good type of an aristocratic Arab, lithe in figure, long, slender hands, dressed in desert costume with sword and flowing garments. The Zabit was as good a type of a brutal Roman soldier, and his chief pleasure seemed to be that of gloating over Deeb and his followers. He used his tongue like a whip-lash, told us the story of their ineffectual attempts to hold the castle against the government, and ended each paragraph with an invitation to Deeb to say : "Allah Yansur es Sultan"—"May God make the Sultan victorious." For reasons that need no explication here Deeb would make the proper response, and the Zabit would then curse him, and tell him that it came from his lips only and not from his heart. It recalled another Arab saying that no Anglo-Saxon can fully understand, "Kiss the hand that you cannot break and bide your time."

We had difficulty in securing barley at Shobek. The Mecca caravan had passed southward some twenty days before us, and all these highland towns had been scoured for provisions of all kinds. This was one reason, but a far more powerful one was



SHOBK VALLEY FROM CITADEL

the presence of the eleven government horsemen whose animals needed barley *every day*. Our muleteers came back in daylight with empty bags, but at sunset some of the people came stealthily and an hour later we had all the barley we needed. Had they declared in daylight the existence of barley in their homes the soldiers would have had either barley or the money very soon.

In hunting for the meaning of Shobek, the modern name of the castle and town, and in searching for some possible connection with the Crusader name, Mons Regalis, we came across a thread of coincidence which may some day lead to a solution. We state it for what it is worth. The last Crusader chief who held Kerak and this outpost of Mons Regalis was Reynald, or Renau de Chatillon, the audacious freebooter, whose perfidy towards Saladin brought on the final slaughter which ended the Kingdom of Jerusalem at Hattin (see Vol. I., p. 115). Chatillon in French has the meaning of a diminutive for the lamprey eel, and it is not a long stretch of the imagination to suppose that Reynald carried somewhere on his armor or banners some symbol connected with this slippery creature. This would of course be a well-known sign to the warriors of Saladin. Mons Regalis, with Kerak, shared the rigors of siege and bloody assault. Reynald must more than once have been shut up within its walls, after raiding the regions round about. Perhaps the final act of the drama, east of the Jordan, was played here, and when at

last the "lamprey eel" was caught, in this almost impregnable fortress, the Saracens, quick then as their descendants are to-day, changed the name, in fine derision, from Mons Regalis to Shobek, for Shobek means in Arabic a fishing-net. The great inscriptions round the fortress walls will some day be gathered, and it is almost certain that some reference will be found in them to the last great scene in the tragedy.

Latin literature should eventually give us the ancient name of Shobek. The fact that there are two Roman roads between Shobek and Petra points clearly to its importance long before the days of the Crusaders.

CHAPTER II

SHOBOK TO PETRA

THIS last stage was an exciting one. The dream of twenty years was about to come true. The long journey of twenty-five days from Beirut was almost accomplished. All difficulties had been overcome, and there was only one short day's ride between us and the goal. Could the actual Petra equal our expectations, or even rank well with the many interesting sights we had seen on our way to it? The cool air of the mountain-tops, and afterwards the warm sunshine, was as beautiful as any winter day could be, and the day will live forever in our memories, as a fitting climax to all that preceded it.

There are two, if not three, roads between Shobek and Petra. We chose the easterly one in going and a more westerly one in returning. We struck camp and were on the march at 8 A.M. Because we no longer had the telegraph-poles to guide the muleteers, and because we were acting as our own guides, we kept our baggage train in sight all day. Our camp in Shobek was south of the fortress, and our barometers registered forty-

seven hundred feet. We climbed out of the valley by a road bearing east, and in fifteen minutes were on the plateau, level with the fortress. Ten minutes later we crossed the watercourse, and, leaving the mill about three hundred yards to the left, pulled slowly up a low ridge, and across two small valleys, our road rising gently all the way. About 9.30, we left the main road and turned up a slope, reaching Bir Kadaa at 10.15. Then we went due south, through a long, narrow valley, up which ran an easy road to the crest, where the barometers marked fifty-seven hundred and fifty feet, or more than one thousand feet higher than Shobek. Crossing this watershed, we dropped into another narrow valley filled with butm trees and carpeted with fresh, green grass. Here and there we saw traces of bears' claws, where these animals had searched for acorns, after the snows had melted away. Beyond another hillside, which showed ruins of some sort, we crossed a ridge, went down a steep slope, and, at 11.40, joined the main road again, which had made a long swing around the mountains to the west of our higher route. After twenty minutes we reached a fine spring among extensive ruins, and sat down for a good luncheon. Our barometers here stood at fifty-four hundred feet, and a few minutes beyond rose again close to fifty-seven hundred feet. Here we found ourselves on the back of a ridge, with a wide view east and west. Then, for a distance of three or four miles, we followed the best bit of Roman road we had

ever seen. It was almost unbroken, and showed exactly what it was eighteen hundred or two thousand years ago. It was made of basalt blocks, at either side a fence-like row protruding above the ground like a border. The street within was triple; there was a road in the centre, paved with large blocks, and two paved ways on either side. These side roads sloped each way from the central dividing line of big blocks to the fence-like rows on either side. The way this road swung around the mountain-tops and over ravines, disdainful of every difficulty, holding steadily to its course southward, was grandly impressive. We thought of the days when a Roman chariot and its proud war-horses could have travelled from these lonely mountain-tops of Edom, up through Asia Minor, over the Hellespont through Europe, and hard up to the borders of Scotland, on just such roads as this. No power but Rome ever held Eastern Palestine secure against the desert, and her roads and bridges are still an enduring monument to her greatness. Among the travellers who preceded us more recently in these regions were two German scholars, Professors Brünnow and Euting, and part of their work was the recovering of the ancient Roman milestones, such as we saw at the Arnon (Vol. I., p. 313). Between Irbid and Petra they have dug up more than two hundred, many of which are covered with fine inscriptions. We saw traces of their efforts at many points, and heard of their work at many places that we did not take time to visit.

After an hour along this magnificent mountain ridge, and before we had ceased to mention and admire the works and power of the ancient Romans, we swung out to the end of the headland. The outlook southward expanded, and suddenly there burst into view, a thousand or fifteen hundred feet lower down and not more than three or four miles away, a wonderful mass of castellated peaks, domes, pinnacles, and other fantastic shapes, with indescribable coloring, from snow-white at the base to purples and yellows and crimsons higher up, bathed and transformed in the brilliant sunshine, till it seemed like an enchanted fairyland. The main mass from side to side was not less than fifteen miles in extent, and the height, as it cleared the surrounding ridges, appeared to be not less than four thousand feet above the sea. All the outlines were smoothed and rounded, as though covered with a veil of diaphanous light. Beyond this mass to the left stood the sharper peak of Mount Hor, with Aaron's tomb glistening in the sunlight, and below them both, five thousand feet down and some distance beyond, was the deep cleft of the Arabah, reaching southward toward the Gulf of Akabah. We gazed enchanted, for somewhere in the heart of this brilliant mass lay the ancient city of Petra, about which we had read and dreamed and were now to see with our own eyes.

And here we experienced a genuine surprise. After all we had read and studied, we had failed to realize that the entrance to Petra from the north



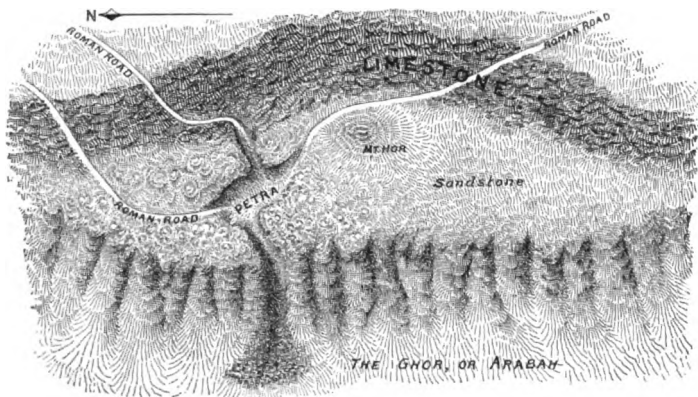
ROMAN ROAD

was a descent, a down-hill road, into the heart of the great rocky mountain, and not an ascent, up some rocky ravine, into an eagle's nest of a city.

The original founder of this stronghold, we now began to realize, must have been a strategist of no mean powers,—a man who was not afraid to break away from precedent, and do an original act.

Most fortified spots in the world's history have been elevations, because men chose to co-operate with nature in making her almost inaccessible places perfectly safe resorts by their ingenuity and skill. We had seen many such places from the beginning of the trip until now. Here, however, was a hole in the ground, as it were, which had proven just as efficient a protection to its inhabitants as a hilltop could be. What a splendid location it was, and how thoroughly guarded by nature, will appear as we proceed. From our standpoint, we could only make out that somewhere, out in the central portion of this tangled and badly eroded mass, there was a depression, deep enough for its surrounding natural walls to hide its bottom from view. A simple inspection of the surface of the sandstone was sufficient to deter us from attempting to cross it, as a more uneven, ragged mass is hard to imagine. It seemed as though, not content with its ordinary work, erosion had produced enormous pinnacles and cut deep fissures beside them, until the natural *chevaux-de-frise* forbade all access from the foot of the limestone walls to the edge of the depression,

which was about two miles away. The following sketch will give a diagrammatic idea of the region, as it would look from the direction of the Arabah in a bird's-eye view.



BIRD'S-EYE VIEW OF THE LOCATION OF PETRA

We had been journeying along a limestone ridge, with here and there an outcrop of basalt or flint from which the Romans built their splendid road. And now we came to the southern edge of the limestone formation with a cliff-like slope of one thousand feet, and were looking down into an ancient geological bay, which nature had filled with this matchless mass of many-hued sandstone.

This bay, in the eastern side of the great Jordan depression, immediately attracted our attention. It was almost semicircular in form, being about twenty miles in length, north and south, and about twelve or fifteen from east to west at its widest portion.

The sandstone mass seemed to fill it to about the same height throughout its entire extent, as far as our telescopes could enable us to judge, Mount Hor itself being but one of many "fragments" left in place during the erosion of the upper surface of the sandstone. All of the elevations upon this lower level were below the point of contact of the sandstone with the limestone, and we found afterward that even the summit of Mount Hor was some four hundred feet below this line.

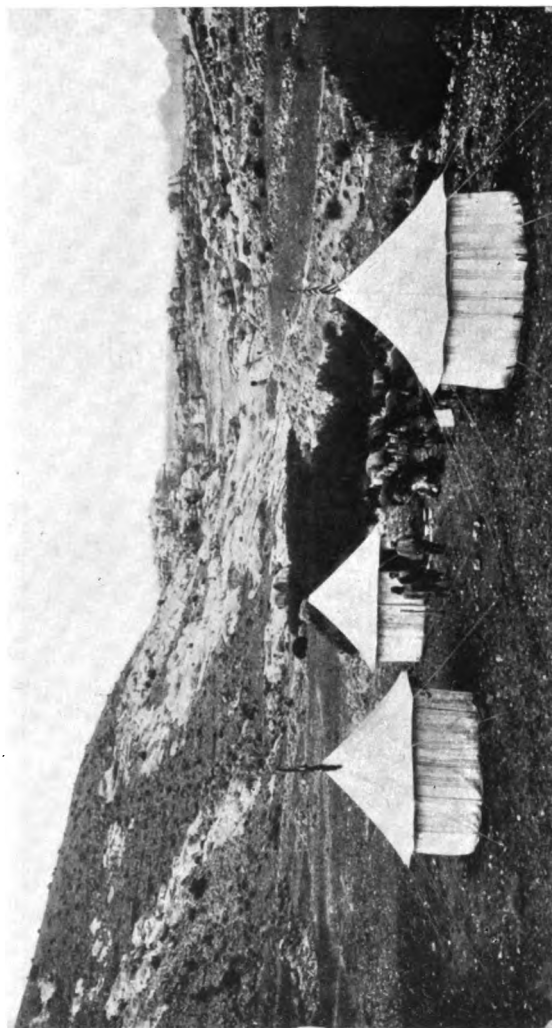
The line of contact between the two formations is non-conformable, and varies up and down through several hundred feet, as far as we were able to investigate it, at the point where we descended from the upper level to the lower. The limestone strata retain their nearly horizontal position throughout the whole eastern side of the bay, and appear in the same position between the masses of sandstone, giving the latter the appearance, so plainly shown in some of the photographs, of having been plastered against the limestone.

The structure of the sandstone throughout indicated that it had been a brackish-water formation, and it varied in consistency even in the same mass; which would account for some of the fantastic forms of erosion so evident on every hand.

We were standing at an elevation of nearly fifty-five hundred feet, and began here our plunge downward into Wady Musa. The limestone rock ceased at forty-seven hundred feet, and there the sandstone formation began. For an hour and a

quarter we continued the steep descent, and, leaving the town of Elji on the left, made our way into the bottom of the valley along which flowed the stream, lined with a thick growth of oleanders. Twenty-one hundred feet had disappeared from the barometric record noted when we stood on the limestone cliff on the edge of the limestone headland above, and we pitched our tents (Camp outside Sik) at an elevation of thirty-four hundred feet, beside the stream at a point where the valley contracts for the last time before it disappears in the great mass of rocks beyond.

While still on the descent, we were met by Arabs from Elji, who asked if we had "the government" with us, and added that they had stringent orders to take to Maan all who came unattended. At this time the caravan was some distance behind us, and Hasan remained with them as guard, while we carried our rifles for protection. We calmly asked them if they had five hundred men to turn us back, and proceeded on our way, for just at that time our men came over the edge of the cliff, making noise enough for an army. Before our tents were up, a number of the Elji people had collected, and, keeping them at a distance, we proceeded to give them some advice as to how they should treat travellers in the future; explaining to them that since the government had taken actual possession of this region, they could no longer worry strangers and extort bakhshish from them under any pretext whatever. If they came to treat



CAMP AT THE OUTER ENTRANCE TO THE SIK

strangers decently, travellers would come without guards, and all such expenses, instead of being paid to the soldiers, would fall into their pockets. They promised to profit by our admonitions, and certainly they gave us no trouble during our stay.

It was now 3 P. M., and our feet were almost within the enchanted ground. We pitched our camp outside for several reasons. We had been assured that pack animals could no longer make their way through the narrow gorge. Besides, Elji was already an hour behind us, and the mule-teers were obliged to go back to purchase barley, making a journey of two hours going and coming. To have entered the city would have added another hour's journey, making the purchase of barley impossible before nightfall. Then, the known character of the lawless people added another consideration that we could not ignore. In Beirut, on our return, our children asked, "But how could you wait another night?" Our answer was, "We could not, and did not!" Taking a rifle and a shotgun, and a small lad as guide, we were soon picking our way into the strangest region we had ever seen. The photographs will help tell the story and make the whole scene clearer than many words can do.

A glance at the photograph (p. 45, Camp outside Sik) will show how the sides of the narrow valley crowded in towards each other. The dark mass between the tents is the growth of oleanthers along the descending brook, which bends

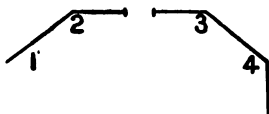
toward the right below the tents. The "View from above the entrance," was taken from a point on the rocks to the right of our camp and looks across the narrow valley, down which we followed the stream. It gives an idea of how the sandstone masses crowd in upon the gorge and completely conceal its existence. Our road among the oleaners was only a cattle path, and was half the time in the brook itself. About two hundred yards from our tents, we came upon the first signs of human handiwork. On the right side of the valley two detached pedestals (photograph, Entrance to Sik, tomb, etc., p. 57), about eighteen feet square and thirty feet high, guarded the entrance to a small lateral valley, in which are many beautiful rock-hewn temples and tombs. They were once surmounted by elongated pyramids of natural rock, such as are seen in the following photographs, but which have been broken or quarried away by later occupants of the gorge and city. We wondered if they did not contain a tomb or sarcophagus on top, but lacking anything in the shape of a ladder, we could not examine them. Some one hundred yards beyond, on the left bank of the stream, is a fine specimen of a two-story cutting (p. 53, Tomb at entrance). The lower tomb once had a fine façade, and many rooms in the rock, but facing the weather it has suffered greatly from storm and wind. A broad stairway, plainly seen on the left, led up to the upper tomb or temple, above which are seen four of the elongated pyramids just



OUTER ENTRANCE OF THE SIK—BEGINNING OF THE SANDSTONE

mentioned. The height of this double rock carving is not less than sixty feet. The tortoise-shaped rock on the right is a detached mass which has been hollowed out, and being supplied with doors and windows, once probably formed a guard shelter or served some such purpose, at the entrance of the city.

Another turn in the narrow valley brought us to the outer end of the gorge (End of Sik outside, p. 55), where amidst a marvellous tangle of stream and oleanders are ruins of what seems to have been a massive portal to the gorge. As far as we could make out the lines, they formed four sides of an octagon, one of which, 2-3, stretched across and closed the narrow entrance to the defile. One might easily reach this point, and even then turn back without finding the entrance, so wild and impossible seems the



whole scene. The way appeared to be completely choked with the mass of oleanders, heaps of cut stones, old foundations, pillars, remains of arches, while the rocks about are cut and carved into blind doors and windows, stairways and pyramids. But, following the stream through a dense mass of brush, we heard it dropping and rushing over a pile of rocks, and suddenly we were face to face with a cliff, which is rent from top to bottom. At last we had reached the entrance to the famous Sik or cleft. Its extreme width is not more than twenty feet, while its sides, only a few feet inside the entrance,

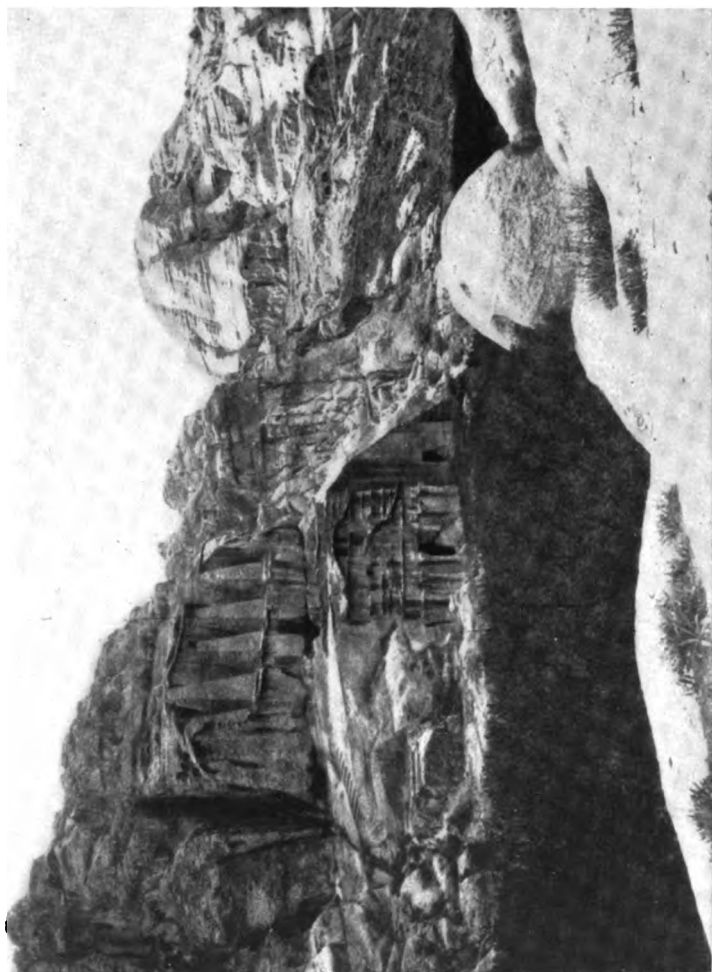
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reach up perpendicularly to eighty or a hundred feet. It was here that a great arch was thrown across¹ from side to side some fifty feet above the water, forming an inner gateway, and perhaps connected with the semi-octagonal wall referred to. But the arch has fallen, and only the lower stones remain clinging to the sides of the cliff.

Into this gloomy looking gorge we pushed, and every step onward added to the charm and mystery of the whole experience. For more than a mile we splashed along among the undergrowth of wild fig trees, oleanders, and ivy. The ravine with its clear stream, and the remains of the ancient paved road along its bed, wind about as if they were the most flexible of objects instead of being confined in a rent through a mighty mountain wall. The precipitous rocky sides towered above our heads at first one hundred feet, then two hundred feet, and at times more than five hundred feet. There were many places where the gloomy sides leaned over the roadway, threatening to crack, and in their crumbling, crush us between their awful masses. Now and then a sharp turn in the defile would carry us out from between the shadowy walls, and apparently straight against a precipice, over which the sunshine fell in cascades of colored light.

To lift one's eyes from the little stream, with its fringe of green, to the gloomy walls overhanging

¹ Existing when Stanley visited Petra in 1852.



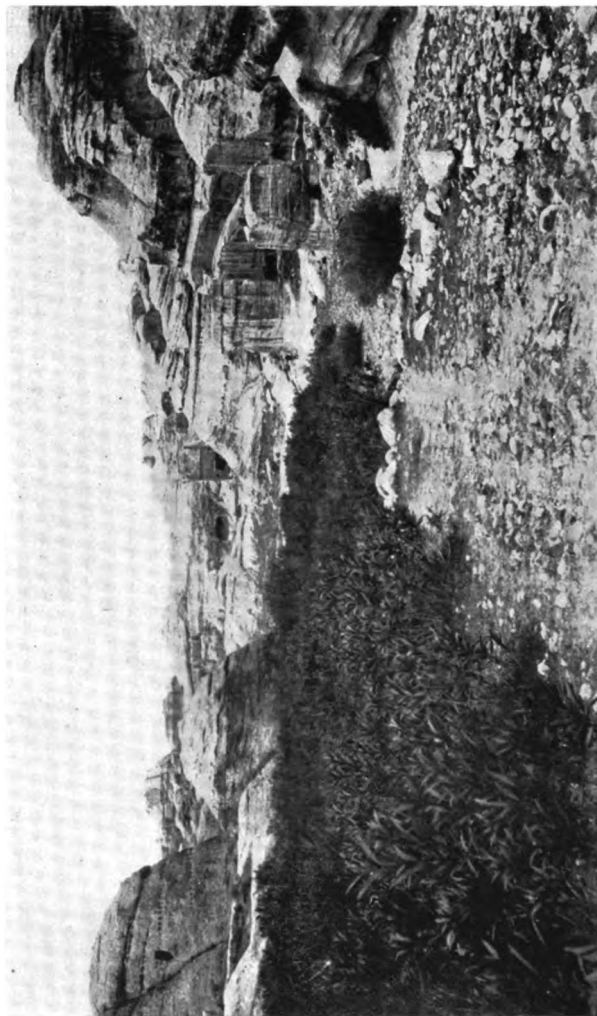
OUTER ENTRANCE OF THE SIK—FIRST ROCK CARVINGS

it, and up through the many-hued layers of sandstone, each growing brighter with the increasing light, to the sinuous ribbon of blue sky, bordered by the sunlit purples of the upper rocks, glowing in the sunshine, produced an effect that beggars description, and would defy a painter's power to reproduce. Seen at morning, at midday, or at midnight, the Sik, this matchless entrance to a hidden city, is unquestionably one of the great glories of ancient Petra. We wandered on, amazed, enchanted, and delighted, not wishing for, not expecting anything that could be finer than this, when a look ahead warned us that we were approaching some monument worth attention, and suddenly we stepped out of the narrow gorge into the sunlight again. There in front of us, carved in the face of the cliff, half revealed, half concealed, in the growing shadows, was one of the largest, most perfect, and most beautiful monuments of antiquity,—Pharaoh's Treasury!

Almost as perfect as the day it came fresh from beneath the sculptor's chisel, fifteen hundred or two thousand years ago; colored with the natural hues of the brilliant sandstones, which add an indescribable element to the architectural beauty; flanked and surmounted by the cliff, which had been carved and tinted in its turn by the powers of nature; approached by the mysterious defile, it is almost overpowering in its effect.

Such is the ancient entrance to the strangest city on our planet. Along its cool, gloomy gorge, filed the

caravans of antiquity, from Damascus and the East, from the desert, from Egypt and the heart of Africa. Kings, queens, conquerors, have all marvelled at its beauties and at its strangeness. Wealth untold went in and out of it for centuries, and now for over thirteen hundred years it has been silent and deserted. We had seen enough for one day. Out of the fading light, into the deepening gloom of the entrance gorge, we picked our way back to the tents among the oleanders with some impressions that death can hardly efface.



OUTER ENTRANCE OF THE SIK

CHAPTER III

EDOM AND PETRA

THE scene around our camp at the entrance to Petra was one of rejoicing. Even the muleteers awoke to the strangeness of the country we had entered, and were eager for the sights and experiences of the mysterious city below us in the heart of the mountain. The air was mild and moist, our tents were in a sheltered spot, compared with our other camping-places, and after doubling the guard, the rest of the men turned in early. We had reached another vantage-point in our journey, and before we slept we went back in imagination over the centuries of history and legend which overlay and interlap like the debris of ancient cities, and were represented around us in such an interesting manner.

When we crossed the Ahsa, between Kerak and Tafileh, we left the land of Moab and entered Edom, whose wild life touches that of the Children of Israel at so many points. This region comes into history as Mount Seir in the days of Chedarlaomer and Abraham. It then embraced the mountainous district from the Dead Sea, south of the

Zered (Ahsa) to the east arm of the Red Sea ; it was bounded on the east by the desert and on the west by the deep valley of the Arabah. Its principal peak was Jebel Neby Harun, known as Mount Hor, which bears the ancient name of the region to the present day. It was the home of the Horites, who emerge at the dawn of human history. It has been supposed that the name "Horites" means "cave-dwellers," but it may also signify "the white race." Professor Maspero identifies it with Khar, the Egyptian name for Southern Palestine.

Sometime after Jacob had fled to Paddan-aram from the anger of his brother, Esau left Isaac his father and made his home in Mount Seir. Eventually his descendants dispossessed¹ the Horites of Mount Seir, gaining possession of the country both by war and by marriage with the inhabitants, and the result of intermarriage was the mixed race known as the Edomites. Their kings reigned in the land of Edom at the time when the Children of Israel were in Egypt. When the Hebrews at length escaped from Egypt and reached the borders of Edom, they found that the fierce fires of Esau's anger still burned in the hearts of his descendants, and neither the king nor the people of Edom would listen to their request for permission to pass through Edom, on their way to the Promised Land, although they offered to pay for both food and water which they might consume (Deut. ii., 4-8), as they passed through. In order not to wage war with a kindred

¹ Deut. ii., 12

people the Children of Israel turned back from the borders of Edom and marched southward through the desert down the Arabah, between the cliffs of the Tih on the west and the range of Edom on the east, until they reached the Red Sea, when they turned to the left. They rounded the southern end of the mountains of Edom and then marched north along the eastern border of Edom toward Moab. This churlish refusal of the Edomites was never forgotten by the Israelites; though the Edomites were regarded as brethren by the law, and were allowed certain privileges beyond some other nations, the hostility of the two peoples to each other disfigures all their mutual relations, until the Edomites disappear forever from history. The Edomites were conquered by David (2 Sam. viii., 14), Jehosaphat, and Amaziah (2 Chr. xxv., 11). In the time of Ahaz, when Pekah and Rezin made war against Judah, the Edomites invaded the land and carried off captives, and a century and a half later when Nebuchadnezzar (587 B. C.) besieged Jerusalem, the Edomites joined in the taking and sacking the city, and appropriated a portion of its territory. Israel's prophets never spared Edom. Joel predicts its desolation, Amos denounces judgment upon it, but foretells the ultimate incorporation of the remnant of Edom with Israel. Jeremiah makes it the subject of one of his minatory poems. Obadiah speaks of little else but the cruelty of Edom to Israel, and the certainty that the Edomites will be destroyed in spite of their rocky

fastnesses, their numerous allies, and their far-famed wisdom. Ezekiel declares the vengeance of Jehovah that awaits it, and Malachi pronounces that its overthrow is to be perpetual.

The Greeks modified the name Edom and called the country Idumea, and its people Idumeans. But it does not appear that the Greeks ever founded any colonies south of Madeba and the Arnon. If they did their remains have yet to be discovered and identified.

About the time of Alexander the Great, an Arabian tribe pushed up from the desert, into the highlands of Edom, and completely supplanted what remained of the Edomites. This tribe or tribes were known as Nabateans, or Nabatheans.¹ Settling down in Edom they devoted themselves partly to agriculture, and partly to commerce. About 100 B. C. they had become a powerful kingdom, and their influence extended all round Syria, from Damascus, which fell into their hands 89 B. C., to Gaza, and far into the centre of Arabia. Their inscriptions are being found all over Eastern Palestine, in the heart of Arabia, and as far west as Italy, proving the extent of their trade connections and influence. A little more than half a century before the Christian Era, the "King of Arabia" intervened in Jewish affairs. He issued from his palace at Petra, at the head of fifty thousand men, horse and foot, entered Jerusalem, and uniting with

¹ Their derivation from Nebajoth, the eldest son of Ishmael, Gen. xxv., 17, is at best problematical.

the disaffected Jews besieged Aristobulus the King in the Temple, and was only driven off by the advance of the Romans. An Idumean, Antipater, was made procurator of Judea by Julius Cæsar; and Herod, son of Antipater, was created King of Judea. In the time of Paul "an ethnarch under Aretas the King held the city of the Damascenes" (2 Cor. xi., 32, and Acts ix., 23).

Aretas IV. seems to have reigned from 9 B. C. to 40 A. D., over the Nabatheans. The relations of the Romans and Nabatheans during the first Christian century have yet to be dug from the records of the past, but inscriptions make it almost certain that their boundary against the Romans in 65 A. D., perhaps also 96 A. D., lay north of Bosra and Salkhat, which were still Nabathean cities. But in 106 A. D., Trajan, by the hands of Cornelius Palma, Governor of Syria, brought the whole Nabathean kingdom into the Empire, and created out of it the new province of Arabia with Bosra as its capital. The Roman dominion relaxed with the decline of the Roman Empire, and into the abandoned cities the Arabs of the desert drove their flocks. There have been no other dwellers in them for more than a thousand years. The ruins of Jerash, Amman, and Madeba, the grass-grown Roman roads of these mountains of Edom, prove beyond a peradventure that no dwellers in cities, except the Crusaders, and that only for a fitful century, have occupied these highlands since the days of the Romans.

Petra, the Rock City, has been to these regions and these peoples what Rome was to the Romans, and Jerusalem to the Jews. Horites, Edomites, Nabatheans, and Romans have all rejoiced and boasted in the possession of this unique stronghold, and most remarkable city of antiquity. If the name "Horites" refers, as many have contended, to the fact that its owners were "cave" or "rock dwellers" and was derived from their mode of life in Mount Seir, then there can be little doubt but that what we know as Petra was one of their earliest homes and strongholds. Even if we can never find a trace of the Horites themselves, the natural features of the locality, the brook and stronghold, like the Nile in Egypt, prove it to be the natural dwelling-place of man. There is no other location in all the Land of Seir that can be reckoned a rival to it.

Like the region, the name of the city has changed from age to age. Under the Edomites it was called Sela, "the Rock," the same in Hebrew as Petra in Greek. Under this name it is mentioned twice in the Old Testament, that is, in 2 Kings xiv., 7, when it was captured by Amaziah, and in Isaiah xvi., 1; but the revisers have placed Sela in the text at Isaiah xlii., 11, and at three other places.¹ The natural features of the city answer the requirements in every particular. Amaziah (2 Chr. xxv., 12) would have no difficulty in throwing ten thousand of the Children of Seir from

¹ Judges i., 36; 2 Chr. xxv., 12; Obad., 3.

the top of the city (see photograph, Deir), and it is natural to suppose that he would have made this exhibition of justice or revenge in the most prominent and public spot of the national capital. The reference in Obadiah 3 to those dwelling "in the clefts of the rock," fits literally the thousands within the city of Petra who made their homes in the side valleys that cut the wall-like mountains on every side.

It was, most probably, in the days of the Nabatheans that Petra became the central point to which the caravans from the interior of Arabia, Persia, and India came laden with all the precious commodities of the East, and from which these commodities were distributed through Egypt, Palestine, and Syria, and all the countries bordering on the Mediterranean, for even Tyre and Sidon derived many of their precious wares and dyes from Petra. It was, at that time, the Suez of this part of the world, the place where the East and West met to trade and barter. It was also, in fact, a great "safe deposit," into which the great caravans poured, after the vicissitudes and dangers of the desert. Its wealth became fabulous, and it is not without some good reason that the first rock structure one sees in Petra, guarding the mysterious entrance, is still called "Pharaoh's Treasury." It must have been the Nabatheans who developed the natural beauties of the situation, and increased the rock-cut dwellings and tombs to the almost interminable extent in which they are found to-day.

VOL. II.—5.

While 106 A. D. is the date when the Romans seized the country, and made Petra the capital of this division of Palestine, they did not apparently attempt any extermination of the inhabitants, but extended the same mild sway as that exercised over the Greek cities of the Decapolis. And, just as the cities of the Decapolis continued their life as Greek cities under the Roman sway, so Petra seems to have continued her Nabathean life under the Roman eagles. Rome has left us her tribute to the greatness of the Edomite city in the fact that she stretched two Roman roads into it from the north, and that among the almost shapeless masses in the floor of the "Rock City" can be traced the ruins of an arch of triumph, temples, a forum, and other accessories of Roman civic life. When Rome's power waned, and the fortified camps on the edge of the desert were abandoned, no doubt her soldiers were withdrawn also from such cities as Petra. Then the Romanized Nabatheans or Nabatheanized Romans held their own against the desert hordes as long as they could, and went down, probably, about the same time as the cities of the Decapolis. From that time onward Petra's history becomes more and more obscure, and for more than a thousand years Edom's ancient capital was completely lost to the civilized world. Until its discovery by Burckhardt, in 1812, its site seems to have been unknown except to the wandering Bedawin.

During all those centuries, Jews and Christians

and scholars of all civilized lands clung to the ancient name of Petra for the city, and Arabia Petræa for the whole region. But when the long-lost city again comes to light, the nomad dwellers seem to have lost the records of the Edomite, the Nabathean, and the Roman occupation, and refer everything in the region to the days of Moses and Aaron.

According to the Koran and its commentators, it was here that Moses struck the rock, and the same fountain still flows under his name, from the village of Elji, an hour above our camp ; and the valley is called Wady Musa. No one in all this region knows it by any other name. The "Sik," or entrance, is called "Sik Wady Musa." All the modern dwellers in that region, and the tradition is centuries old, say that "as surely as Jebel Haroun is so called from being the burial-place of Aaron, so this Sik is the cleft made by the rod of Moses when he brought the stream through into the valley beyond." While Petra had been in our minds during all these years, our permit from Damascus was to visit Wady Musa ; our dragoman and caravan were hired for the same point ; in all our conversations with the people of that country we never made use of any other term but Wady Musa. And we found to our amusement and surprise that perhaps not a single tent or house in all that mountain region was without a "Moses" among its children or old people. Moses has taken possession of the region. Notwithstanding the attach-

ment of the name of Moses to the locality, modern biblical scholars and explorers generally, with the distinguished exception of Dean Stanley, reject the tradition that Petra is Kadesh-Barnea.

The "Horites" and "Mount Seir" carry us back to the early chapters in Genesis, "Edom" touches the history of the Children of Israel, from the days of the wilderness to Malachi, "Idumea" binds its history to the New Testament times, "Petra" links the region to the dominion of the Romans, and "Wady Musa," neglecting all that lies between, brings the Hebrew lawgiver and the earliest of the Hebrew prophets into closest contact with the Prophet of Islam and the Mohammedan religion. What we have yet to find is the history of the third, fourth, and fifth centuries after Christ. Madeba, Kerak, and Shobek, have yielded up a part of their secrets, and Christian scholars have been surprised at the extent and strength of Christianity in these regions. There are not lacking suggestions of Petra's greatness, but the veil of mystery has not yet been lifted.

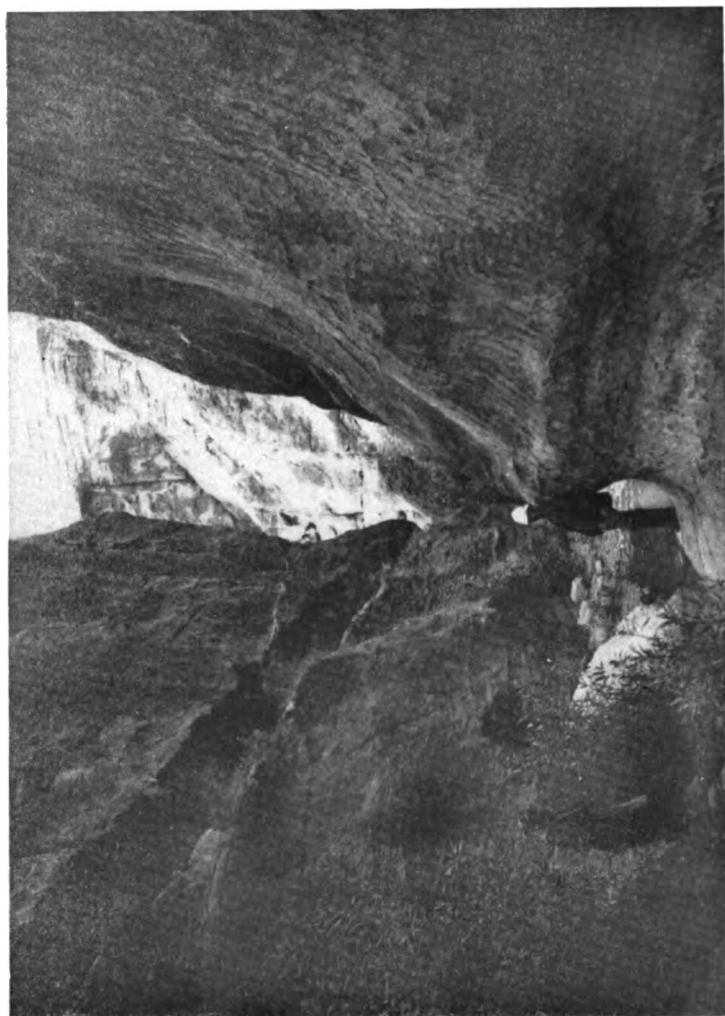
CHAPTER IV

INTO PETRA

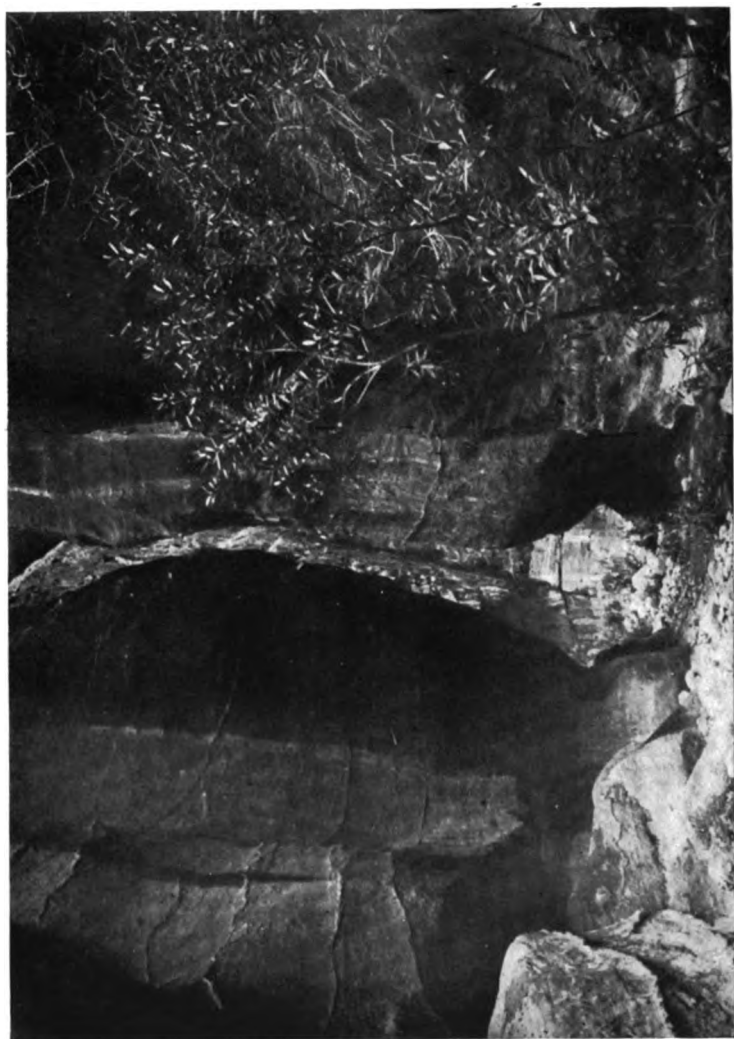
ON page 325 (Appendix III) is a list of the travellers who have entered Petra during the nineteenth century, or at least those who have left some record of their visits. Nearly all entered by stealth, more than half were driven out after a hurried glance at the wonders and mysteries of the place. Not more than three or four were allowed to spend a night within the ruins, and nearly all paid well for the privilege. We were certainly the first Americans to enter openly, to pitch our tents for five days, and to float the American flag unmolested within the ancient city. The story and record of the unsuccessful attempts to reach the site would make a very long chapter. Gray Hill, Esq., of Jerusalem and Liverpool, made four unsuccessful attempts in 1890, 1891, 1893, and 1895, and succeeded at the fifth attempt, in 1896. Hull, Kitchener, and Armstrong, in 1883, paid a bakhshish of £34, English money, for six persons to get a hasty view of Petra and Mount Hor. Almost every traveller of the past century has come back with stories of the iniquity and perfidy of the

people of that region. Thanks to the Waly of Damascus, with the co-operation of the officials in that region, by keeping a firm hand over the members of our caravan, and by treating all we met with fairness and politeness, we entered and returned without any untoward event, beyond rebuking some of our own men for presuming on our strength and prestige in their financial dealings with the people of Elji.

When we awoke on March 1st, it was raining soft showers on our tents, but by 7.45 A.M. the clouds broke away, and by nine o'clock our whole caravan was in motion, and they passed with difficulty among the oleanders, as we approached the narrow defile. The day before we had entered on foot, and in our pleasurable excitement had paid little attention to the pools of water, the heaps of debris left by the winter floods in the narrow gorge, the masses of oleander and wild fig trees, which almost closed the defile at points, but when we attempted to ride through, and lead our heavily laden mules, with their bulky loads of tents and canteen, we found it no easy task, and realized the wisdom of having camped outside on our arrival. At a dozen places along the defile we saw the muddy line of the winter floods which, dammed by heaps of rocks and stones caught by the trees and bushes, had risen ten, fifteen, and twenty feet up the sides of the gorge, before the temporary barrier had given way and allowed the imprisoned waters to rush onward. It was easy to imagine that a sudden heavy



GORGE OF THE SIK



GORGE OF THE SIX

shower in the winter months might close this exit to any who might be camping inside. We had been assured at many points of our journey that we could not get our loaded animals through the gorge; but by rolling boulders out of the way, filling in pools here and there, paying no attention to the tearing of tent wrappings and the banging of our canteen and other boxes against the rocks, we succeeded in getting all the caravan safely as far as the "Treasury of Pharaoh," and then paid no attention to them, for beyond that all was easy.

Having the whole day before us for the short distance and the setting up of our camp, we moved leisurely, using the cameras more frequently than ever, and endeavored to verify many of the statements of preceding travellers.

The length of the Sik or defile, not all of which is seen on Laborde's plan, has been variously estimated, but after passing through it three times and timing our passage, it is safe to say that from the fallen arch to the Treasury of Pharaoh—which is the real Sik—it is about one and a half miles long, or about twenty minutes' walk.¹ If we add another ten minutes from the Treasury to the Amphitheatre which marks the beginning of the city, then the defile is two miles long. It would require much time to plot it accurately, but the general contour is a wide semicircular swing from the right to the left, with innumerable short bends, having sharp curves and corners in its general course.

¹ G. L. Robinson in 1900 made it twenty-two minutes.

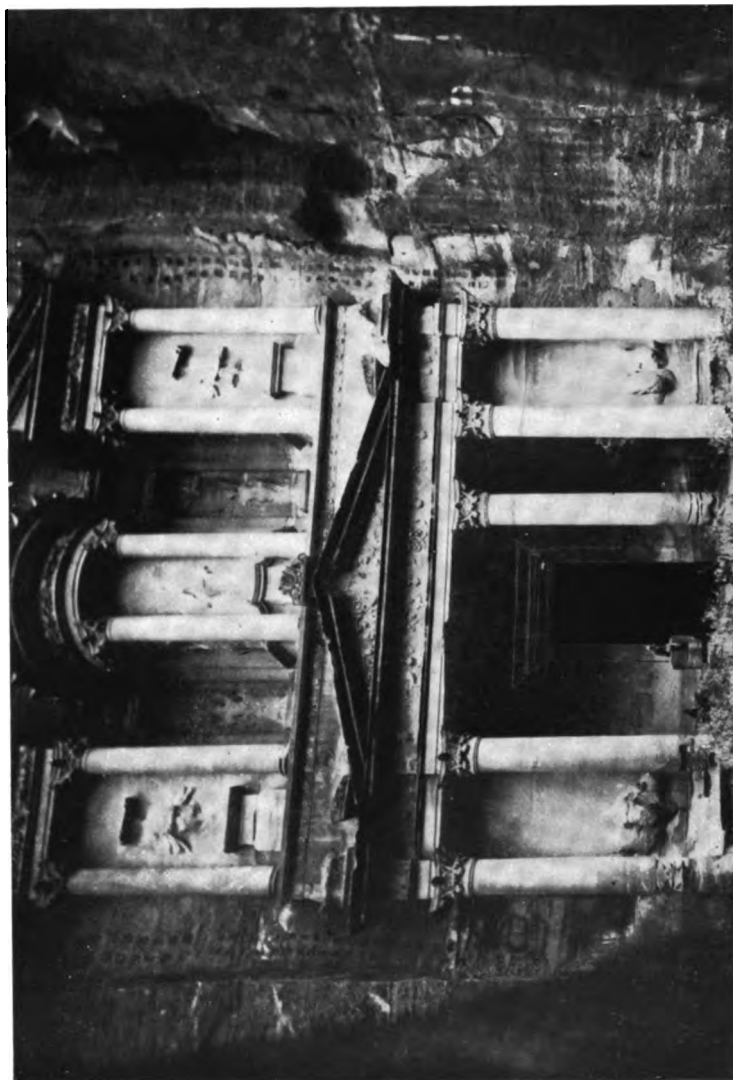
The width of the Sik varies from twelve feet, at its narrowest point, to thirty-five or forty in other places. Where the gloomy walls actually overhang the roadway, and almost shut out the blue ribbon of sky, it seems narrower ; and perhaps at many places above the stream the walls do come closer than twelve feet. (See Petra, gorge of the Sik.) Photographs of these narrower and darker portions of the defile are impossible. Only where the walls recede, and one side catches the sunlight, was it possible to secure any views that would reveal the actual beauties of the place. Then no camera could be arranged to take in the whole height of the canyon. The photograph, page 77 (Pharaoh's Treasury from the gorge), is a fair sample of the effect produced by the winding surfaces of the walls during fully seven tenths of the distance through the gorge.

Travellers have estimated the height of these perpendicular side cliffs to be from two hundred to one thousand feet.¹ Heights, like distances, in this clear desert air, are deceptive, but after many tests and observations we are prepared to say that at places they are almost sheer for three hundred to four hundred feet. This represents the canyon proper, for the rounded upper portions do not cut much figure under the circumstances. The face of the cliff at Pharaoh's Treasury must be well up to two hundred feet in height, and the masses above the Sik generally are higher, as we saw clearly

¹ Hornstein, 1895: "80-200 feet." Stephens, 1837: "500-1000 feet."



77 FIRST VIEW OF THE TREASURY FROM THE GORGE



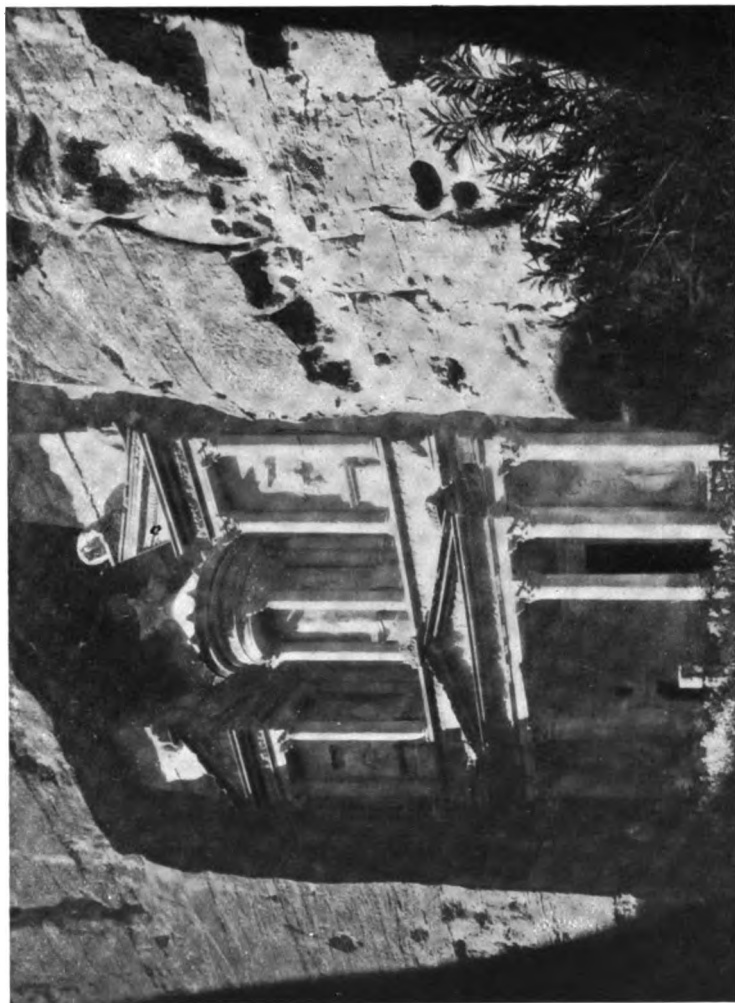
FIRST VIEW OF TREASURY FROM THE ENTRANCE OF THE SIK

from the High Place, which is nearly four hundred feet above the floor of the valley in front of the Treasury. The "View from inside Pharaoh's Treasury," of the Sik, gives an excellent idea of the opening as seen by one going out of the city, though here also the camera fails to get in the full height. The visible portion of the cleft is fully one hundred feet high.

The floor of the Sik was once paved from end to end with huge blocks of stone about eighteen inches square. These appear *in situ* at several points, and are covered by debris at others, but in the narrower portions the scouring of the winter floods has torn them all away. Stephens in 1837 entered Petra from the south over the rocky rampart, and when he came to the Treasury he saw a full stream of water gushing through the narrow entrance and filling up the whole mouth of the Sik. With difficulty he forded this, at times on the shoulders of his guide, and made his way into the defile for a short distance. How the ancients managed these storm-bursts cannot now be told, but the waters of the fountains in the valleys above were all lifted out of the floor of this gorge and carried along either side of the ravine in aqueducts, cut from soft sandstone, which are still in evidence at a hundred places. On the right side of the defile are the remains of a more modern aqueduct, which is plainly Roman. A clay pipe about eight inches in diameter was let into the face of the cliff, and secured by

Roman cement. So strong and durable was this cement that even to-day the pipe is detached with difficulty. While the floor of the valley dropped lower and lower, the pipe rose higher and higher above the roadway, bending with every turn of the sloping walls, and below the Treasury it was led around the face of tombs and temples, in and out of rocky ravines, and ultimately it emptied its waters somewhere in front of the Corinthian tomb, fully two miles away from the point where it received its supply from the brook. It is plain, therefore, that the waters of the Fountain of Moses were led carefully into the city itself, and not allowed to be polluted and lost in the floor of the defile and valley below. In all our later explorations we saw abundant evidence of the existence of running water all about the city.

The structure of this pipe and its method of jointing were so interesting from an engineering standpoint that it is worth mentioning, as our best modern ideas on such matters are scarcely an advance upon this old piece of work. The sections of the pipe were about eighteen or twenty inches long, and had double spigot ends. They were made of a fine-grained clay, and probably formed in a wicker mould, with the hand, by placing ring after ring of a continuous spiral of clay inside the mould, and then roughly smoothing the inner surface, and pressing the rings together. This produced a series of slight ripples on the inside, which were reproduced in the formation of the calcareous



THE TREASURY FROM THE NORTH

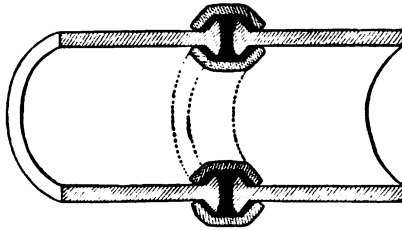


85 ENTRANCE OF THE SIK, FROM THE INTERIOR
 OF THE TREASURY

deposit with which the inside of the pipe has become encrusted. The thickness of the clay did not vary much from a quarter of an inch at any place in the pipe, and all those sections which we could examine were carefully made and as carefully fire-baked. The pipes were joined together with a double sleeve, one outside and the other inside, which must have been put on the pipes in halves, the inner one being placed in position through the end of the pipe after the outer one had been secured in place.

While this method of construction undoubtedly constricted the lumen of the pipe, a very strong and secure key-joint was the result, which made it most difficult to break, even after all these years. This key is shown in the darkly-shaded portion of the drawing of a cross section of a pipe given below.

The constriction produced by the inner collar may also explain the regular and even coating of deposit from this hard water, which is practically uniform in thickness on all portions of the interior of the pipe, and is thicker and many times stronger than the pipe itself. The deposit was not as thick on the collar itself, as on the pipe between the collars, a result probably produced by the retardation of the current of water.



CROSS SECTION THROUGH CLAY
WATER-PIPE—PETRA.

Such is the Sik, the famous gorge which in ancient times was the chief, if not the only usual approach to the strangest city in this region. It was the great glory and the strength of Petra, and is still unique among the sights of the earth.

When we stepped again from the narrow defile into the open space at Pharaoh's Treasury, we were hardly prepared for the vision of beauty that burst upon us. A glance at the plan (p. 97) will show that the Treasury is almost directly in front of the end of the Sik, and that the mountain mass is cut again at right angles to the Sik, by two transverse ravines, which form with the Sik a perfect cross. The ravine to the right is an inaccessible one, that to the left we named the Fairy Dell (see p. 165). The morning showers had started a thousand little rills of sparkling water, white fleecy clouds floated in the blue sky above, and down this Fairy Dell came the floods of the morning sunlight. We reached the spot at a moment when all nature seemed conspiring to enhance the thrilling effect of the scene. The surrounding cliff, more than five hundred feet from side to side, cut and fashioned by the hand of time, the frost, the heat, and the tempest, its enchanting forms dripping with rain-drops, which caught and seemed to hold the slanting sunbeams; all these formed a matchless setting for the gem of Pharaoh's Treasury, carved like a cameo at its base. If the combination of the sunlight, the coloring, and the work of time on the cliff was passing beautiful, then that of the sunlight, the





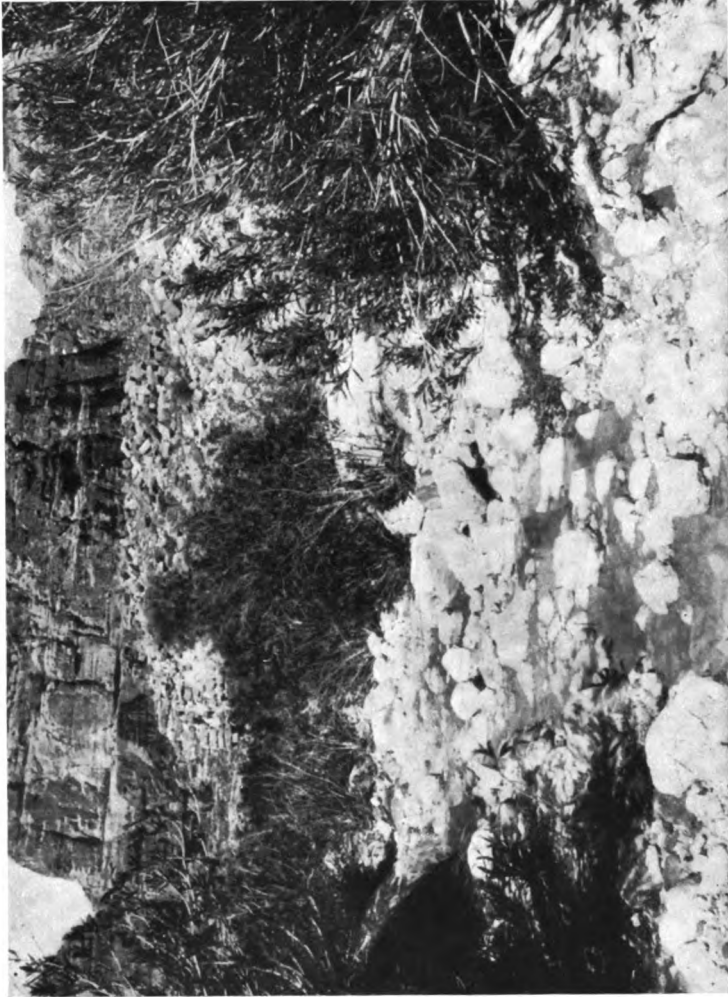
PETRA—INNER ENTRANCE TO THE SIQ

coloring, and the work of the hand of man as seen in the carving at its base surpasses the powers of language to express the emotions produced by it at such a time. Descriptions of the width and height and the details of this monument of antiquity may enable many to reproduce for themselves some of its striking features. The beautiful photographs on pages 79 and 83 will add still more to the pleasure of those who have never seen it, but neither language, measurements, nor pictures can give more than a bald idea of the temple and its charming surroundings.

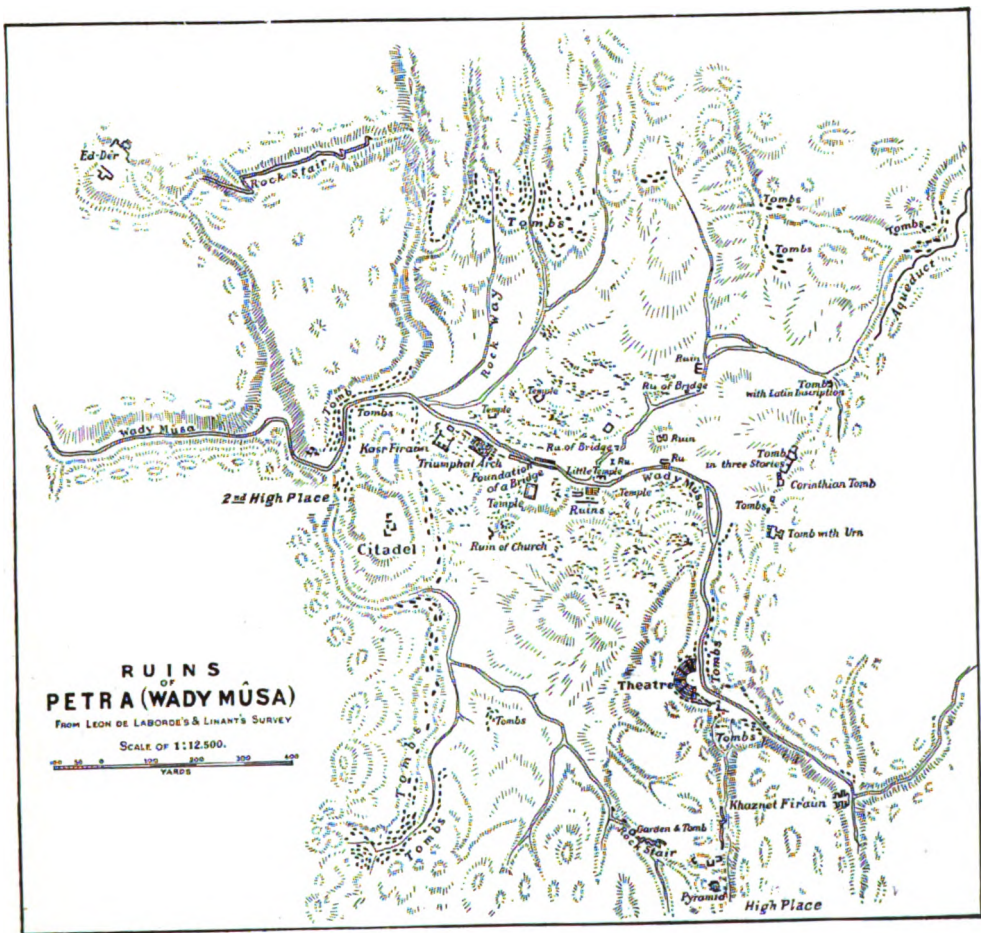
Men may differ in their discussions as to the purity of the architecture, its age, its purpose, but measured by the impressions it is sure to produce upon every one who visits the spot, it must surely rank among the first of the beautiful monuments of antiquity. John Stephens, coming direct from the banks of the Nile, and writing years afterward, said: "Even now that I have returned to the pursuits and thought-engrossing incidents of a life in the busiest city of the world, often in situations as widely different as light from darkness, I see before me the façade of that temple; neither the Coliseum at Rome, grand and interesting as it is, nor the ruins of the Acropolis at Athens, nor the Pyramids, nor the mighty temples of the Nile, are so often present in my memory." The secret of its magic seems to be the combination of one of man's best efforts with the powers and beauties of nature.

Located at the end of a long and difficult journey, whether one comes from the valley of the Euphrates, from Sinai, from Egypt, or from any part of Syria, east or west of the Jordan ; set in the mountains of mystery, at the gateway of the most original form of entrance to any city on our planet ; carved with matchless skill, after the conception of some master mind ; gathering the beauties of the stream, the peerless hues of the sandstone, the towering cliffs, the impassible ravine, the brilliant atmosphere, and the fragment of the blue sky above,—it must have been enduring in its effect on the human mind. We saw it in its desolation, a thousand years after its owners had fled, after a cycle of storm, tempest, flood, and earthquake had done their worst, aided by the puny hand of the wandering Arab, to mar and disfigure it, and we confess that its impression upon our hearts and memories is deathless. Again and again we returned to the spot, each time to discover something new, and to carry away some new reverence for the hearts that thus communed with nature, and toiled to produce what would continue forever to deeply delight and impress the human soul.

The open space in front of the "Treasury" is not more than one hundred feet wide, and hence it was difficult to secure a front view that would take in the whole height. The photograph (No. 1) consequently does not show the full height of the temple. Floods at different times have carried the rocks and soil up into its portico, so that the olean-

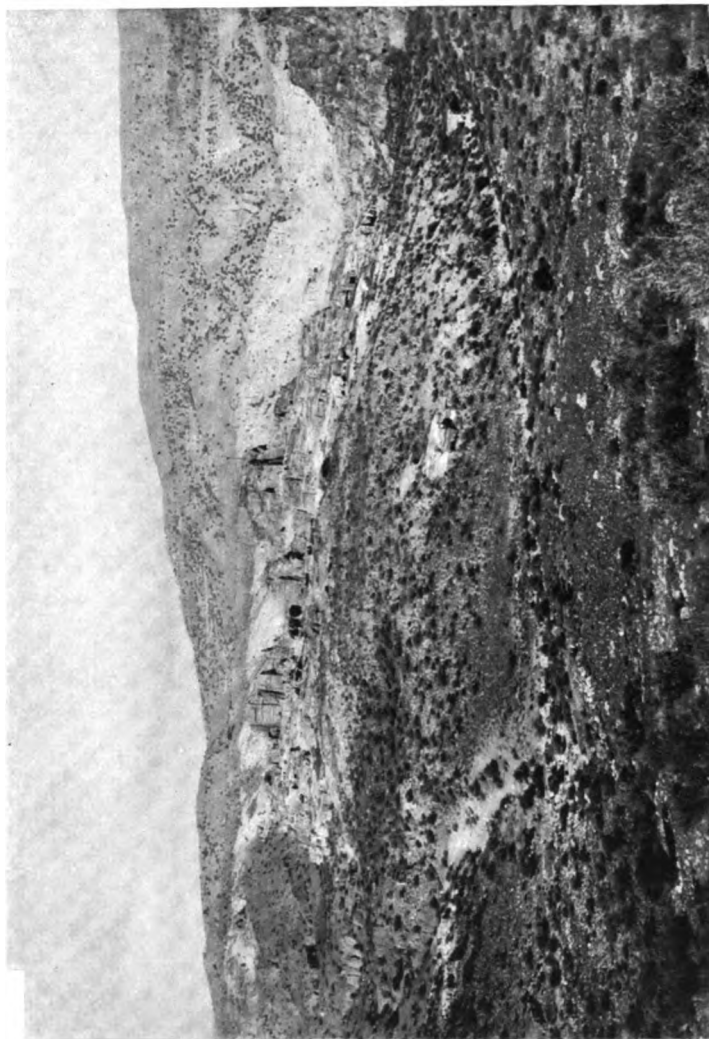


THE LAST OF THE WATER—PETRA VALLEY



ders now touch the bases of the columns. The height of the cutting in the rock for the temple façade is about ninety feet, and one can get a comparative idea of its size by noticing the two horsemen among the oleanders, and the figure on the top of the broken column. The carving and lines on the architrave are nearly as clear and sharp as they were when fresh from the chisel thousands of years ago. The figures in both the upper and lower story seem to have been done in a softer stratum, and have no doubt been marred and mutilated by Mohammedan iconoclasts. The upper story is solid, and the urn and ball over the central dome is the fabled depository of Pharaoh's treasures, and is the point at which the modern Arabs drive their bullets in the hope of shattering it. It will be noted in Photograph No. 2 that the two side sections have the pyramidal extension which joins to the cliff above. Within the porch there are three doors, each opening into rock-hewn chambers. The central room is almost a perfect cube of forty feet each way. It shows no sign of decoration of any kind, only the beautiful natural colors of the sandstone. The two side chambers are entered from the porch and do not communicate with the central one. They are smaller and just as plain in every way. Circular windows pierce the wall over the two side doors. The central door is nearly thirty feet high and fifteen feet wide. What seem like Roman eagles are still to be seen over the two side doorways.

Before we had completed our examination of the Treasury, the clouds sent down fresh showers of rain, and we found the porch an excellent shelter. We had allowed our riding animals to go on into the city with the caravan, but we were joined by three Arabs—Musa ibn Sabbah, who afterwards became very useful as a guide; a suspicious-looking specimen called Solomon, and a rollicking boy named Rshood. We had our revolvers, and for more than one reason amused ourselves by firing at marks chosen in the opposite cliff, a hundred and fifty or two hundred feet away. Our smokeless powder, singing bullets, and the empty cartridge shells which these fellows fought over were all commented upon at great length by our ragged spectators. Solomon carried an unusually long weapon of antique workmanship, with flint-lock and a wide pan for the powder. After we had chipped the rocks many times with our bullets, we persuaded him to try at the mark with his gun. He produced a little powder from his ragged clothing, and after arranging it carefully in the pan, he raised his antique weapon and pointed it toward the mark. Our desire to see the gun shoot was tempered by the fear that a charge of good powder would surely blow the weapon to pieces, to the sorrow of the owner and all who watched him. But curiosity overcame our scruples, and we stood near enough to see. After he had sighted the mark, he pulled the trigger, we all winked, and—nothing happened. When we opened our eyes, Solomon was



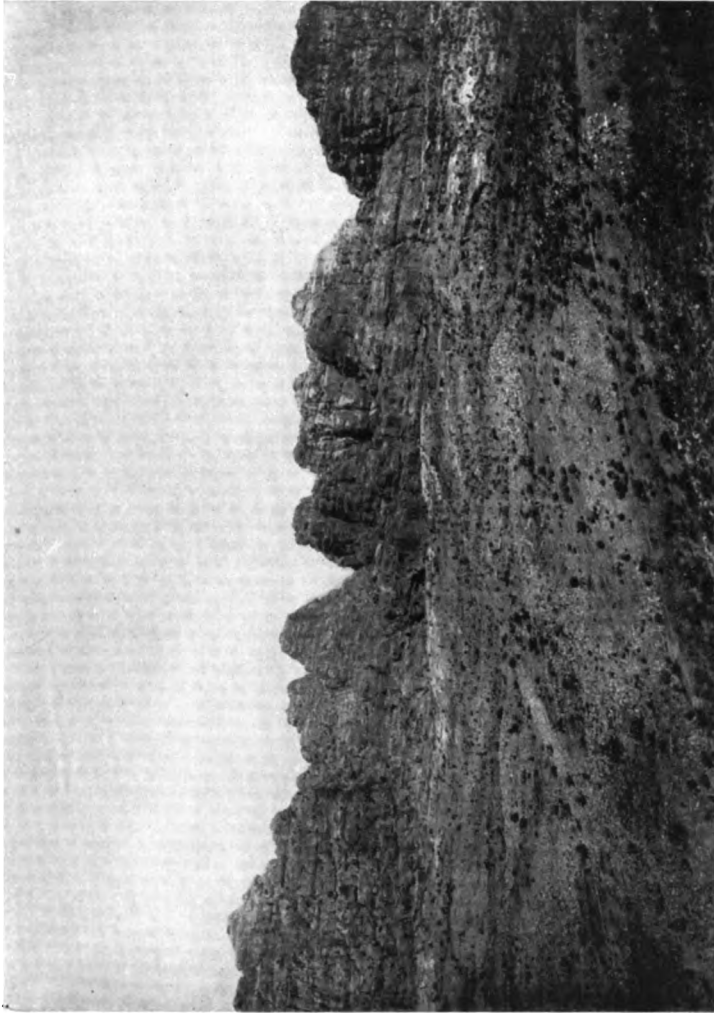
PETRA VALLEY—GENERAL VIEW TO THE SOUTH

hanging on to the mark, the powder was sizzling in the pan, and continued to do so for fully a second and a half, burning his beard, and then came the explosion, which was terrific. Flames and smoke issued from the muzzle, while the breech kicked like a mule, and Solomon made haste to extinguish his smoking beard, and condole with his jaw, which had received the kick of the weapon. The bullet flew wide of the mark, and we were relieved to find the man alive and unharmed. We then tore open some shot-gun cartridges and gave him the powder and shot, as a reward for his bravery in standing behind such a gun. We also charged him not to use more than half as much of our powder when he reloaded.

While we stood and talked with these men, we noted two facts which go far to tell the story of how they live, and the poverty and insecurity of the region. When Solomon proceeded to reload his gun, he had neither rags nor paper to use as wadding. The only rags in the region were those on his back, and paper was unknown. So after pouring in the powder, he stooped and picked up some goat droppings, and used them for wadding below and above the shot. This we afterwards found was the universal custom in those parts. We noticed also that while Solomon had a gun sling of common rope by which he carried the weapon when not in use, he had also an iron chain of about four feet in length wound round the stock just behind the trigger. Seeing our interest in this, he smiled and

said he was sure we did not know the meaning of the chain. We confessed that we did not; then he went on to tell us that his gun was about his only possession, and the country was such that he never let go of it by day or by night. By day the rope was a sufficient guard, but every night before sleeping he unwound the chain, and tied the wretched gun to his left arm, lest an enemy should come and steal it while he slept. If tied by a rope, a knife would easily sever that bond, but tied by a chain the gun was safer! This was one of the modern specimens of poverty and lawlessness dwelling near and roaming through this ancient seat of wealth and security!

Toward noon the showers ceased for a time, and we started down the main ravine to the right of the Treasury. From the Treasury onward the side walls are not so high nor so close together as in the Sik proper, and are or have been an almost uninterrupted series of rock-hewn rooms and tombs. Many of these are inaccessible, because their stairways are worn away by the elements or broken down by the rocks falling from above. Stanley well called it the "Appian Way" of the ancient city. We passed the amphitheatre, and a thousand other rock cuttings, and made our way to the camp, which had been pitched on a level space near the ruins of the triumphal arch. Here we could unpack in earnest, for here we planned to rest longer than we had at any place since leaving Beirut, just twenty-five days before. Our men went for barley



PETRA VALLEY—WESTERN WALL



PETRA—SITE OF ANCIENT CITY

to Elji, an hour away; a shepherd was sent for, and arrangements for milk and the purchase of a sheep were concluded. After a luncheon we took our shot-guns and went for a preliminary walk, having also in mind some partridges, to add to our larder for the Sabbath. We found two kinds of these gamey birds; the large variety we had shot all the way from Banias (*Caccabis chukar*), and the smaller rock partridge found only in the Jordan Valley and the southern wilderness (*Ammoperdrix heyi*). The chukar, called "hajl" elsewhere in Syria, is here known as the "shinnar," and Musa and Rshood assured us that each bird was "as large as a rooster"! We soon bagged enough for the Sabbath, and the recurring showers drove us into one of the rock-hewn rooms for refuge.

Here we saw another sight and learned another lesson from our ragged companions. While we were at luncheon, Musa aimed his gun at a black-bird and wounded it so badly that rollicking Rshood caught it, and when we sat down in the cave he produced the wounded bird from his bosom. After watching them try to kindle a fire with the steel and flint, we offered a match, and soon had a cheerful little blaze to sit around. Rshood then took out his knife and cut the throat of the blackbird, and began a process of cooking that recalled the stories we had heard of our most remote ancestors. Instead of plucking off the feathers, he dangled it over the flames until he had singed away everything but the wing feathers.

He then tore off the head and extremities of the wings, and spitted the bird on a stick. After browning it considerably on the outside, he tore it open, and removed a part of the entrails. At this point he needed salt. So, balancing the spitted bird near the fire, he went to the inner walls of the cave, and with his knife scraped off some of the dirt and filth containing saltpetre. This he sprinkled on the bird, and plastered inside of it. Then he held it over the fire, turning it and tearing it until it was roasted as brown and as juicy as any game ought to be! His fingers and teeth finished the process, and in a short time there was not an atom of it to be seen!

When we returned to camp we found the lamb slaughtered, the oven in the midst of the flames, the bread on the way to baking, and everybody in a famous good humor. Towards night the mules and horses were all taken into a huge rock dwelling two hundred yards away, and after tightening our tent ropes, and ditching round the camp, we lay down to sleep in Petra, careless of the beating rains which kept up for nearly half the night.

The next morning the bed of the Wady Musa, in front of our tents, which had been dry the day before, was occupied by a fine stream of pure water, eight or ten feet wide, and several inches deep. By noon, however, the elastic little stream, which doubtless shortens or lengthens with each shower, had slackened in its flow and disappeared entirely among the rocks, swallowed by the thirsty soil. See



111 PETRA VALLEY—GENERAL VIEW TO THE EAST
Showing the Relation of the Sandstone Walls to the Limestone Cliffs

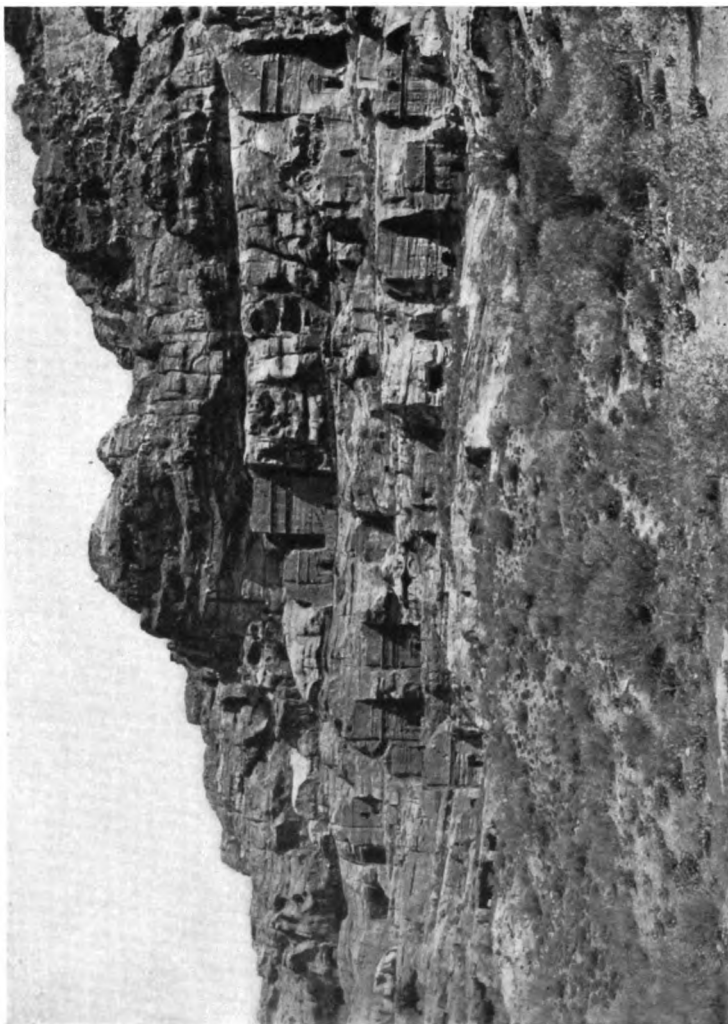
photograph, page 95, "Last of the water." In another twenty-four hours we had to walk a couple of hundred yards up the bed of the stream for our water supply. The pure water from the sandstone, which was filtered and aerated by nature, was pleasant to drink, after our experiences with the hard, limestone water, often badly polluted, which we had been forced to use up to this point on our trip.

VOL. II —8.

PETRA

"It seems no work of man's creative hand,
By labor wrought as wavering fancy planned ;
But from the rock as if by magic grown,
Eternal, silent, beautiful, alone !
Not virgin-white like that old Doric shrine
Where erst Athena held her rites divine ;
Not saintly-grey, like many a minster fane
That crowns the hill and consecrates the plane ;
But rosy-red as if the blush of dawn
That first beheld them were not yet withdrawn ;
The hues of youth upon a brow of woe,
Which man deemed old two thousand years ago.
Match me such marvel save in Eastern clime,
A rose-red city half as old as Time."

From Burgon's Prize Poem, "*Petra*."



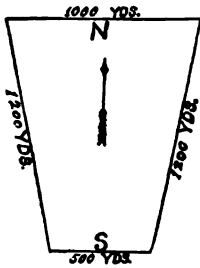
TOMBS ON THE EASTERN WALL OF PETRA VALLEY

CHAPTER V

PETRA

BEFORE entering upon the detailed examination of the wonders of Petra, it will be of service to the reader to have in mind some general observations concerning the three great features of the ancient city—the site itself, the marvellous coloring of the rocks, and the amount of the excavations. The reader will do well to keep the excellent plan of Laborde and Linant open before him. The site is a natural amphitheatre, fully three miles in circumference, and encompassed on all sides by rugged mountains, of most fantastic shape, which rise sheer in many places from two hundred to six hundred feet. Any general view of this is almost impossible, but the two on p. 181 and p. 185 taken from a point more than six hundred feet above our camp (Petra, view from High Place) will well repay examination with a magnifying-glass. This rocky rampart is cut at only two places, where the brook enters by way of the Sik, already described, and where the brook escapes, after crossing the site of the city, by a ravine that descends in tremendous leaps toward the Arabah and the Dead Sea.

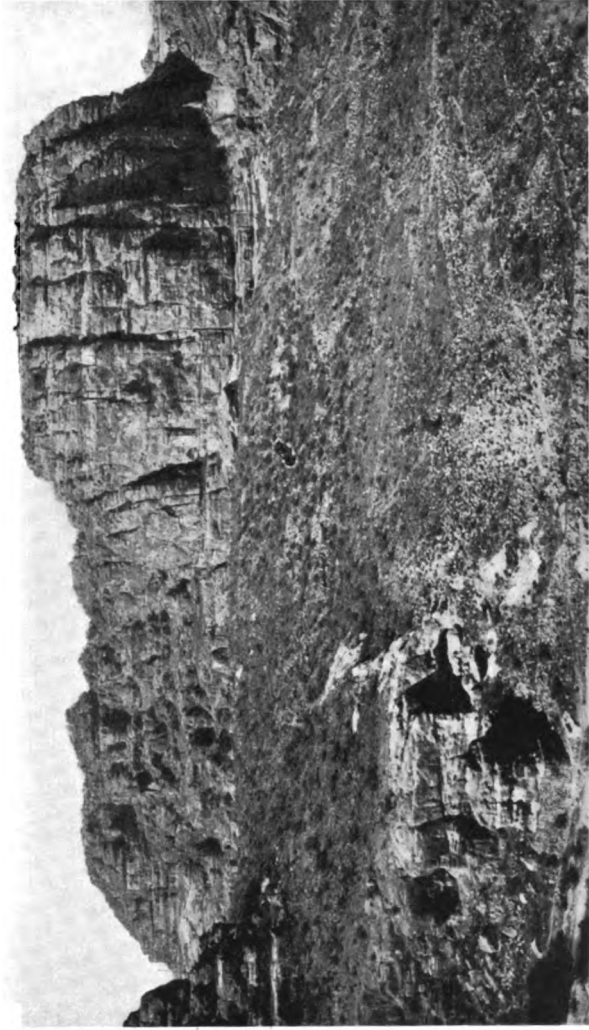
The floor of the amphitheatre is an irregular trapezoid, whose northern and southern sides are nearly parallel. The northern boundary is about one thousand yards across, while the southern is about half as much, and the two sides are roughly twelve hundred yards long.



The brook enters at the southeast corner, swings round a hillock, and crosses from east to west. This floor is by no means level except one fine wide space lying toward the northeast,¹ but in general it rises from the brook to the north and to the south. Even though the whole of this area was covered with a mass of dwelling-houses, palaces, temples, and triumphal arches, all prostrate now in almost indistinguishable confusion, it would prove very narrow limits for such a city as we are sure Petra was at many stages in her history.

But a glance at Laborde's plan (p. 97) will show that from this trapezoidal floor of the valley open out more than a dozen huge fissures which extend for thousands of feet up into the rocky ramparts, as, for example, the Sik, the Fairy Dell (p. 165) the road to the Deir (p. 213), the route to Mount Hor (p. 233): and these interminable ravines and extensions made the city so much larger than the narrow limits would seem to allow.

¹ See photograph, p. 105.



PETRA—CITADEL ROCK

A square space a mile on every side will not suffice to cover these ramifications. And while the floor of the main depression is a mass of ruins almost everywhere, it was in the rocky walls and these ravines, extending upwards on all sides, that the ancient dwellers hollowed out more theatres, tombs, and temples than any one has ever been able to count.

In short the site itself, when viewed from above, seems like one huge excavation whose depth in certain parts is fully half the width of the city's floor. Seen from below, however, nothing can be finer than the immense rocky rampart which almost completely encloses it. Strong, firm, and as immovable as nature itself, it seems to mock at the walls of other cities, and the puny fortifications of the greatest builders of the earth. Taken together with its matchless entrance, it is certainly one of the most wonderful locations in the world.

To portray the marvellous coloring of these masses of sandstone, and to give anything like a correct view of this unique feature of Petra, is something we attempt with misgivings. From the moment we sighted the great castellated mass in which the city lies hidden,¹ until we took our last glimpse from the highlands above, we never ceased to wonder at the indescribable beauties of the purples, the yellows, the crimsons, and the many-hued combinations. Whether seen in the gloom of the Sik, or the brilliant sunshine that seemed to

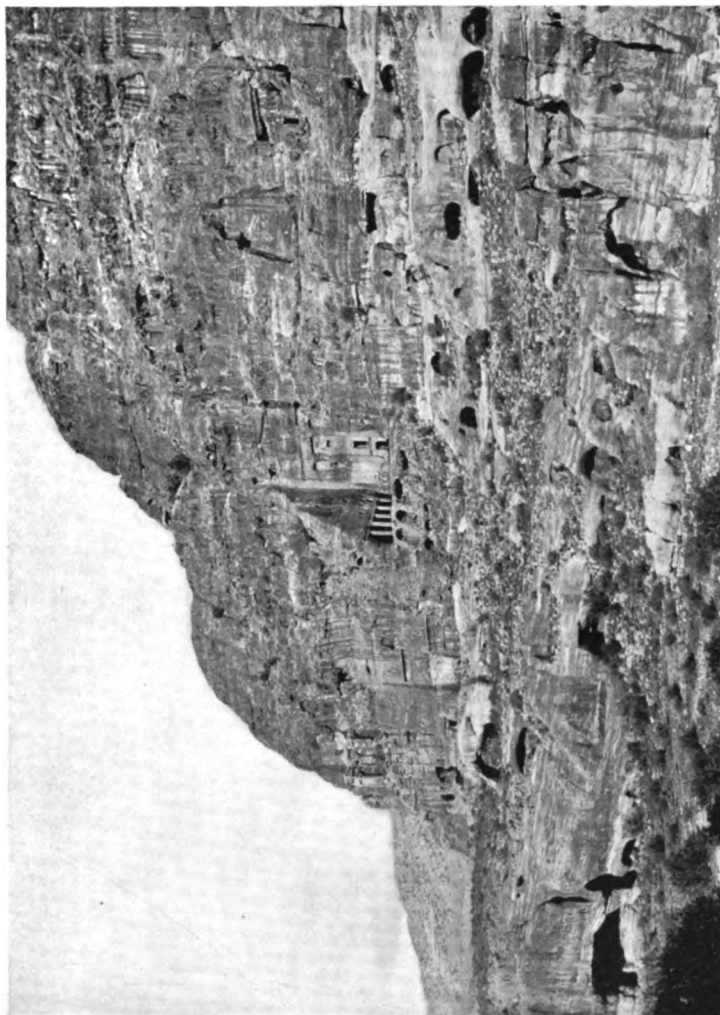
¹ See p. 38.

kindle the craggy, bristling pinnacles into colored flames, they alike inspired our surprise.

Travellers have vied with each other in their attempts to describe these beauties. Some have seen less than they expected, and some have seen more, and the reasons are not hard to imagine. Some have entered the lonely city tired and worn by the long journey over the desert from Egypt, carrying their lives in their hands, and able to make only the most hurried examination. Others have lacked the eye of the artist, and perhaps also the gift of color in their mental make-up; but even the most sober and least sentimental have left testimonies that fully substantiate Petra's claim to being unique among the many sights of the earth.

John Stephens, in 1835, speaks of the dark background of the "stony rampart, with veins of white and blue, red, purple, and sometimes scarlet and light orange, running through it in rainbow streaks," and "within the chambers where there had been no exposure to the action of the elements, the freshness and beauty of the colors in which these waving lines were drawn gave an effect hardly inferior to that of the paintings in the tombs of the Kings at Thebes."

Edward Robinson, in 1838, speaks of "an endless variety of bright and living hues, from the deepest crimson to the softest pink, verging also sometimes to orange and yellow. These varying shades are often distinctly marked by waving lines,



PETRA—TEMPLE IN EASTERN WALL OF VALLEY

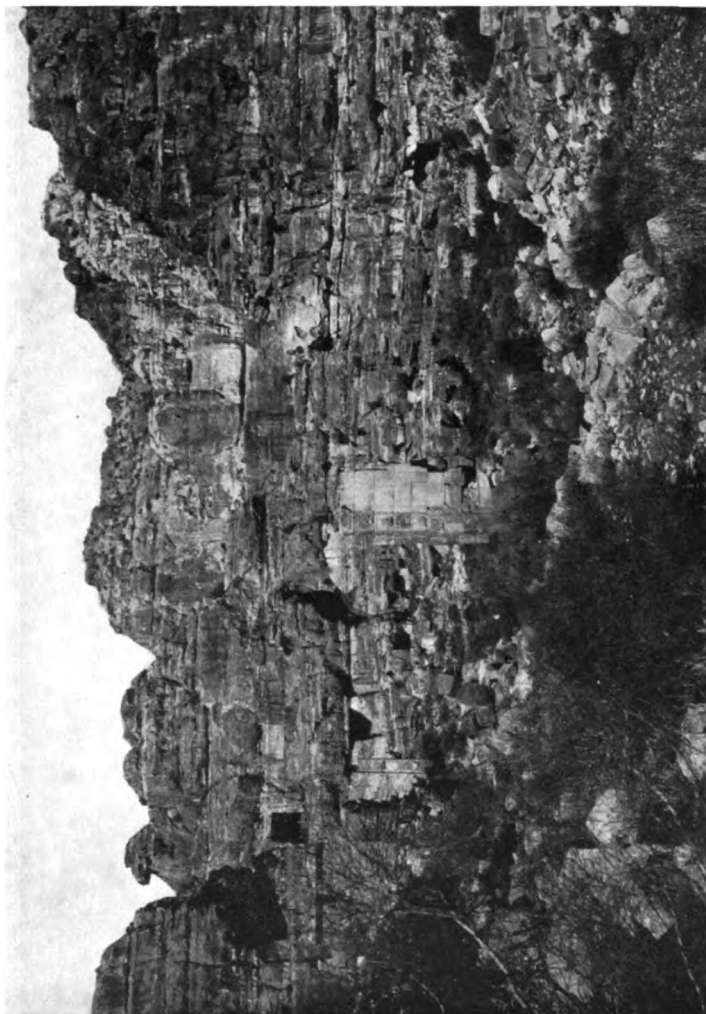
imparting to the surface of the rock a succession of brilliant and changing tints, like the hues of watered silk, and adding greatly to the imposing effect of the sculptured monuments."

Dr. Stephen Olin, in 1840, says in his narrative : "The rocks of Petra are adorned with such a profusion of the most lovely and brilliant colors as I believe it is quite impossible to describe. Red, purple, yellow, azure or sky blue, black and white, are seen in the same mass in successive layers, or blended so as to form every hue and shade of which they are capable, as brilliant and as soft as they ever appear in flowers, or in the plumage of the birds, or in the sky when illuminated with the most glorious sunset. The red perpetually shades into pale or deep rose or flesh color. The purple is sometimes very dark, and again approaches the hue of the lilac or violet. The white, which is often as pure as snow, is occasionally just dashed with blue or red. The blue is usually the pale azure of the clear sky or the ocean, but sometimes has the deep and peculiar shades of the clouds in summer when agitated by a tempest. Yellow is an epithet often applied to sand and sandstone. The yellow of the rocks of Petra is as bright as that of saffron. It is more easy to imagine than describe the effect of tall graceful columns, exhibiting these exquisite colors in their succession of regular horizontal strata.

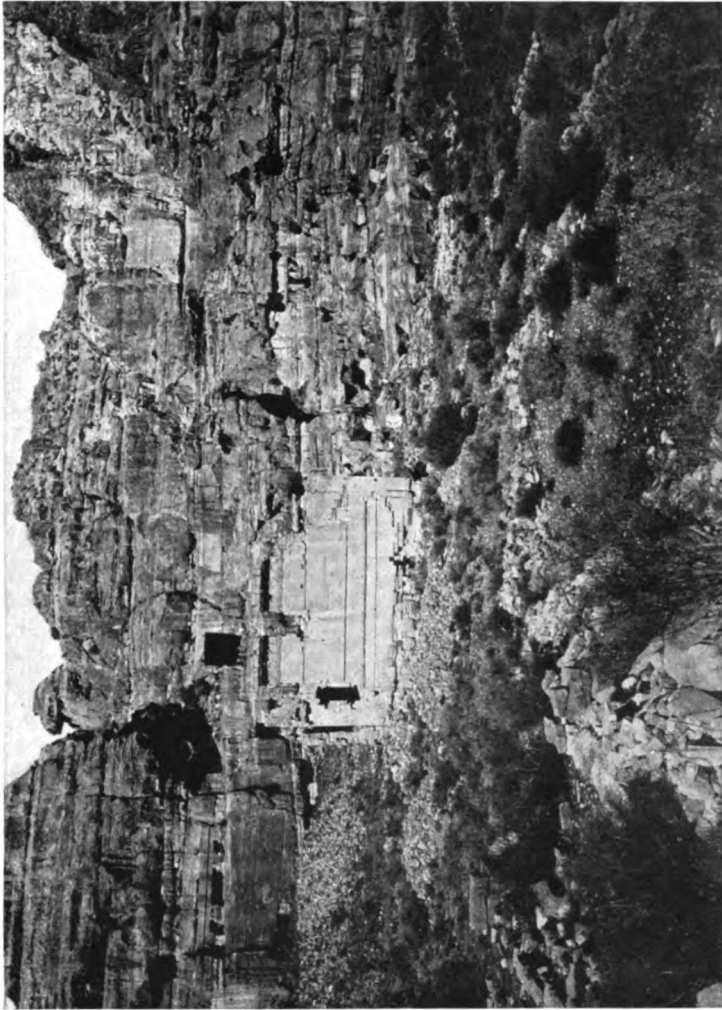
"They are displayed to still greater advantage in the walls and ceilings of some of the excavations where there is a slight dip in the strata. This

gives in the perpendicular sides of the excavation, greater breadth and freedom to the exhibition of colors, while in the ceiling, the plane of which makes a very acute angle with that of the strata, the effect is indescribably beautiful. The colors here have full play and expansion, and they exhibit all the freedom of outline and harmonious blending of tints observable in a sunset scene. The ceiling of a large excavation just at the entrance of Wady Syke, and nearly opposite to the amphitheatre, affords an example of the magnificent effect which I so vainly attempt to describe. In the northern half of the ceiling a brilliant deep red is the predominant hue, intermingled, however, with deep blue, azure, white, and purple. No painter ever transferred to his canvas with half so much nature and effect, the bright and gorgeous scene painted on the western clouds by a brilliant sunset in summer. On the northern or front part of the ceiling these hues are deeply shaded into black, and no one, I am sure, can look upon it without being strongly reminded of a gathering tempest, and almost imagining that he listens to the voices of coming winds or thunder. I shall probably fall under the suspicion of extravagance and exaggeration in what I have written upon the subject, and I would plead guilty to a charge of imprudence, in attempting to portray in words scenes which painters alone can exhibit with any approach to the reality."

Dean Stanley, in 1852, entered from the south and characteristically describes his impressions ;



PETRA—REMAINS OF ARCH OF TRIUMPH



PETRA—TEMPLE NEAR CITADEL ROCK

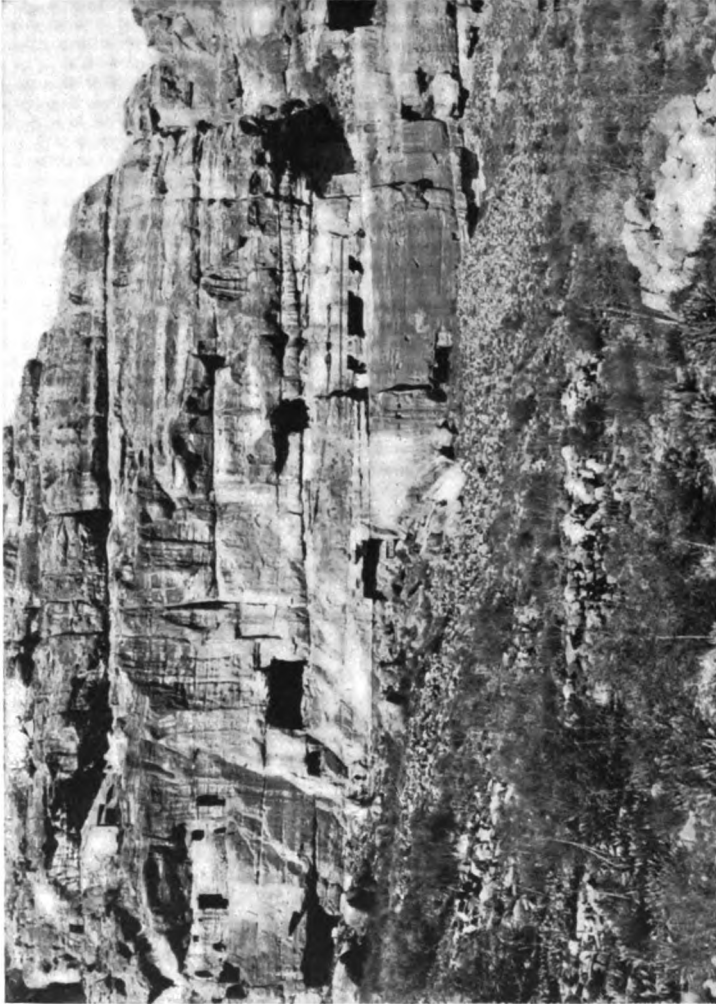
"After descending from Mount Hor we found ourselves insensibly encircled with rocks of deepening and deepening red. Red indeed from a distance, the mountains of 'Red' Edom appear, but not more so than the granite of Sinai; and it is not till one is actually in the midst of them that this red becomes *crimson* and that the wonder of the Petra colors fully displays itself."

"Two mistakes seem to me to have been made in the descriptions. All the describers have spoken of bright hues—scarlet, sky blue, orange, etc. Had they taken courage to say instead, *dull* crimson, indigo, yellow, and purple, their accounts would have lost something in effect, but gained much in truth. Nor would they have lost much in any way. For the colors, though not gaudy, or rather because they are not gaudy, are gorgeous. You are never, or hardly ever, startled by them. You could never mistake them for anything else but nature; they seem the natural colors of the place."

"Another mistake is that the descriptions lead you—or at least they lead me—to suppose that wherever you turn at Petra you see nothing but these wonderful colors. I have already said that from a distance one hardly sees them at all. One sees the general contrast only of the red sandstone cliffs standing out against the white limestone and yellow downs which form their higher background. But when one comes in face of the very cliffs themselves, then they are, as I have said, a gorgeous, though dull crimson, streaked and suffused with

purple. These are the two predominant colors, and on the face of the rocks the only colors. But the whole region is in a constant state of mouldering decay. You can scarcely tell where excavation begins and decay ends. It is in the caves and roofs and recesses, whether natural or artificial, very numerous it is true, but not seen till you are close within them, that there appears that extraordinary veining or intermixture of colors in which yellow and blue are occasionally added—ribbon-like to red and purple. Of these three comparisons usually made—mahogany, raw flesh, and watered silk,—the last is certainly the best.”

Edward Hull, in 1883, looking with the stony eye of a geologist, says: “The coloring of the sand-stone cliffs of Wady Musa should not pass unnoticed; it is wonderfully gorgeous, possibly altogether unique. I have seen colored sandstones in the British Isles and in Europe, but never before colors of such depth and variety of pattern as these. The walls of rock reminded one of the patterns on highly painted walls, Eastern carpets, or other fanciful fabrics of the loom. The deepest reds, purples, and shades of yellow are here arranged in alternate bands, shading off into each other, and sometimes curved and twisted the into gorgeous fantasies. These effects, due to infiltration of the oxides of iron, manganese, and other substances, are frequent in sandstones to various degrees; but nowhere, as far as my observation goes, do they reach the variety of form and



PETRA—THE UNFINISHED TOMB

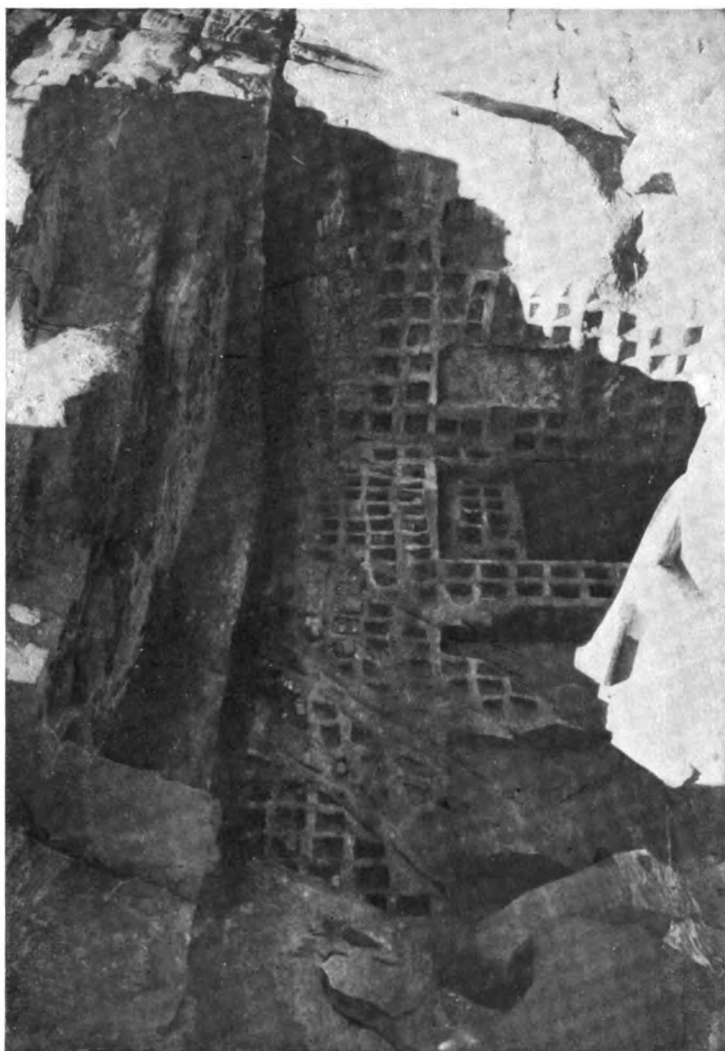
brilliancy of coloring to be found in the Wady Musa amongst the ruins of Petra."

Lord Kitchener—then Colonel (1883),—with the eye of the soldier, speaks of the "colors of the rocks as wonderfully variegated and most brilliant; red to purple and blue are the most predominant colors, and these are set off by a cold gray background of limestone hills."

If then the gentleman traveller, the trained geographer, the brilliant church historian, the college president, the geologist, and the great soldier, only one of whom (Stephens) spent a night inside of Petra and saw something of the sunset and sunrise glories, were so deeply impressed with the variety and brilliancy and beauty of the coloring, we shall be pardoned if we make continual reference to it, as we pass in and out among its many monuments and winding ravines. We shall be listened to if we say with all soberness that "the half was never told" of the effects of this many-hued landscape; for we saw it glistening with the raindrops after the showers; we saw it before the sunrise, and in the weird beauty of the afterglow; we saw it under the noonday sun; and we noticed, as perhaps no one had done before us, the way in which those ancient sculptors fixed the levels of their tombs and temples and dwellings so as to make most artistic use of the more beautiful strata in the mountain walls; and we marvelled again and again, in the never-ending ravines, how those ancient dwellers consciously practised a kind

of landscape gardening, where instead of beautiful effects produced by banks of fading flowers, all was carved from the many hued and easily wrought solid stone which took on new beauties as it crumbled in decay.

Some travellers have expressed themselves as disappointed with the number of excavations visible from any one point, and even Dean Stanley wrote —“I had expected to be surrounded by rocks honeycombed with caves—but in the most populous part that I could select, I could not number in one view more than fifty and generally fewer.” But, like so many other travellers, Stanley camped somewhere south of Petra, entered in the forenoon, passed through the amphitheatre, and out again the same day. But even in that case he must have passed the eastern wall, where for a thousand feet or more the face of the cliff to a height of three hundred feet was once completely honeycombed with these tombs. Exposed to the storms from the south and west, the decay has been very great, but even now it contains a marvellous amount of excavation (see p. 123 Temple in east wall). And the view at the end of the Sik and of tombs near the inner entrance (p. 115) will show clearly that Dean Stanley was napping when he wrote that sentence. Add to this the fact that a camera at most takes in an angle of thirty to sixty degrees and we see that an observer at any of the three points mentioned above could count hundreds of excavations. Furthermore, a glance at Laborde's plan and the red



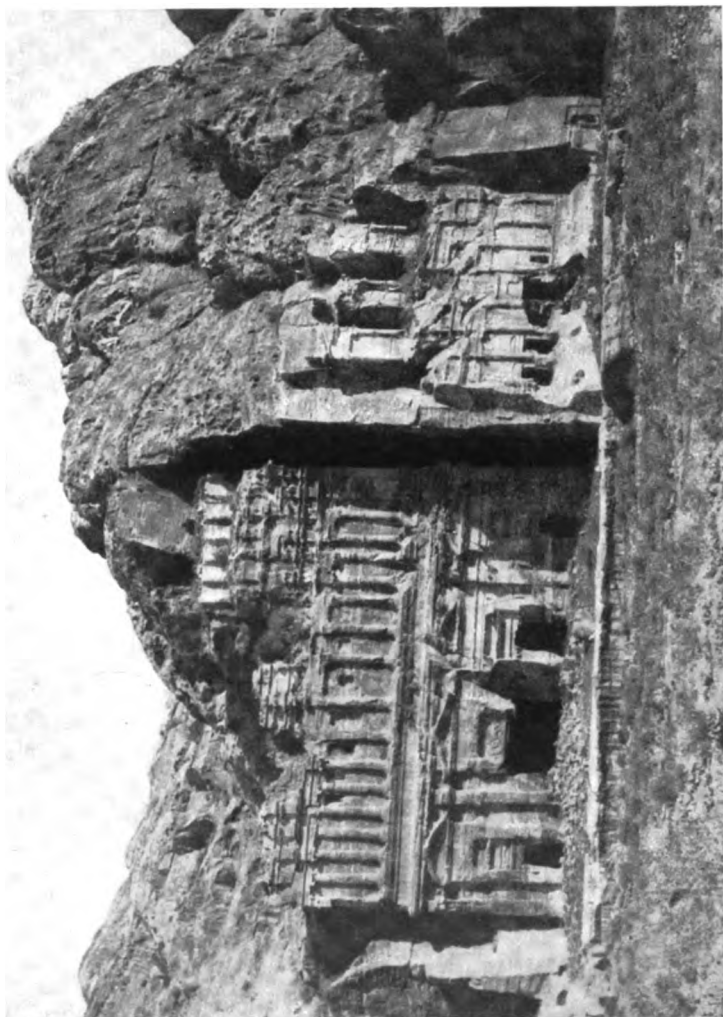
PETRA—THE COLUMBARIUM

dotting in the various fissures and ravines will recall the fact already referred to, that these ramifications are almost numberless, and that here abound excavations interminable. These excavations are not always "caves," but roads and stairways, platforms, tombs, dwellings, and temples, many of which no modern traveller has yet seen, and which no man has ever counted. Thousands are now inaccessible, because the approaches have been weathered or washed away. Thousands more are filled or covered with debris. After five days inside the city—and the following pages will show how much climbing we did—we are prepared to say that a man might spend a month in attempting, and then fail, to visit and examine all the rock-cuttings in the valley. Their number and extent can no more be determined by a glance from the floor of the valley, than the streets and houses of a great city can be enumerated by one taking a hasty view from the public square.

And here we may give a suggestion or two to travellers who will follow us. None of the so-called "guides" will take strangers to see everything. They are jealous, and cannot rid themselves of the conviction that we are hunting only for hidden treasures, and will carry away what rightly belongs to the dwellers in that region. Therefore explorers must be their own guides, and never accept the proffered information, "There are no more excavations in that direction." One of the more friendly fellows, Musa ibn Sabbah, who served Messrs. Brunnow and

Euting, came to us repeatedly, not to our dragoon, and offered to lead us by night, to see something that he dare not show us by day. While having no reason at all to suspect anything like foul play, we did not give the matter enough attention, for after we left Petra we received information that leads us to believe that somewhere among the tombs is still to be seen a mummy, which some one else may have the pleasure of bringing to light. Certainly many of the tombs, rifled long ago, must have contained the bodies of wealthy merchants, who died and were embalmed along the banks of the Nile, and then carried across the desert to their own rich tombs in Petra.

And finally, if the traveller, in nearing Petra, will remember the fact that originally the whole valley, from its beginning at the door of the Sik until its exit among the fissures at the southern end of the Dead Sea, is one huge excavation made by the powers of nature,—the torrent and the earthquake; and that the hand of time, the frost, the heat, and the tempest have been busy through the ages, cracking, smoothing, chiselling mountain-top, deep ravine, and towering cliff into a myriad of fantastic forms; and that the subtler, silent agencies of nature's alchemy have been adding the most brilliant hues to mouldering sandstone strata, he cannot but be charmed and amazed by the result of her handiwork. Then when he enters the city by the winding valley of the Sik, gazes at the stupendous walls of rock which close the valley and en-



PETRA—CORINTHIAN TOMB AND TEMPLE

circle this ancient habitation, and marks how man himself, but an imitator of nature, has adorned the winding bases of these encircling walls with all the beauty of architecture and art, with temple, tomb, and palace, column, portico, and pediment, while the mountain summits present nature in her wildest and most savage forms, the enchantment will be complete, and among the ineffaceable impressions of his soul will live the memories of a visit to this silent, beautiful "rose-red city half as old as Time."

CHAPTER VI

PETRA IN DETAIL

SUNDAY dawned clear and bright after the rain and clouds of midnight. The air was cool and pleasant, and the whole camp of men and animals enjoyed to the full the rest after the long journey. We reviewed much that we had read before, in the few books we carried with us, and then strolled out of camp, and went for a long walk down the western ravine, through which the brook escapes from Petra. At the beginning of the exit, the towering sides are not more than sixty feet apart but open out at two points below where lateral valleys or fissures come down to the bed of the stream. The floor of the ravine, when not completely filled with the shingle and the stream, was choked with an almost impassable growth of oleander and other bushes. At places we made our way with difficulty, and more than once were turned back to find another opening. The fall of the stream for nearly a thousand yards in its winding was gentle enough but making a sudden turn toward the north it began to drop by great leaps, and we found ourselves scrambling along a steep

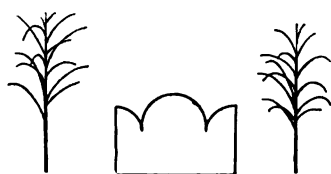
embankment of debris at the base of the cliffs which towered above us, until further progress was impossible. We looked down into a yawning abyss, that seemed to us forever impassable to any human foot. Several hundred feet below us, we caught sight of a colony of conies, which, like a dozen litters of little pigs, were running in and out among the rocks in great trepidation. We amused ourselves, but not the conies, by starting great rocks, weighing half a ton, on frightful journeys down the slopes of the chasm. They leaped and bounded and crashed in a way that was terrific, sending the booming echoes reverberating up and down the gorge. The conies must have thought the end of the world had come, and the startled partridges went clucking and calling into places of safety.

We noted that for fully five hundred yards, after leaving the city level, the walls of the gorge were lined with excavations, which extended tier above tier to a height of from sixty to a hundred feet. Then, for the next thousand yards, the ravine had evidently served as the ancient quarries of the city, and the sides were smoothed in places to a height of fully a hundred feet. There was an abundance of mason marks and rude carvings on the face of these cliffs, left by the workmen at all stages of their work. Many of the marks were plainly legible, others were made out by the aid of an opera-glass, because they are wholly inaccessible. At one point we discerned a rude representation of two trees,

standing on either side of an altar, like the drawing below.

The trees seemed meant to represent palms, but of this we could not be certain.

The mode of quarrying was plainly exhibited by the work left in all stages of its execution. The



men climbed by means of footholds cut into the rock, up the face of the cliff, for say one hundred feet, and gaining a standing place on some ledge

proceeded to hollow out a half dome-shaped cavity, where they could rest and perhaps sleep at the end of the day. With their chopping tools, the same as used all over Syria to-day, and toothed in the same way, they proceeded to cut a channel, both ways from the dome-shaped cavity, as far as they wished. By deepening this channel, day by day, the result was to detach from the cliff a slice, say fifty feet long, and eight or ten feet thick, according to their needs of large or small stone ; as they worked behind the mass, they were in no danger, and from time to time, they threw down the detached masses into the valley below, and in the course of months, they would again be working at the level of the floor of the valley. This process was apparently repeated for centuries, since the quarries are very extensive. Modern quarrymen climb the face of a cliff, work a huge blast in behind a great mass, and throw it down to workmen below, who then



cut it into shape for handling. These ancient quarrymen, lacking powder and dynamite, did practically the same thing, but dislodged their mass by the slow and more laborious way of chopping in a channel just wide enough to accommodate the human body.

On our return we found the camp in commotion, and a wretched specimen of an Arab¹ was tied to a clump of bushes, in the central space between our tents; his arms were tightly pinioned behind him, and his back was covered with a mass of bleeding welts. Our men were excited, and it was some time before we could get the story pieced together. They had made arrangements with the fellow to supply us with a certain amount of milk, and on his appearance to-day had quarrelled with him over the price. When pressed too harshly, he whipped out a huge revolver, and threatened to shoot some one. The camp rose as one man; Hashim, our soldier, rose with them; the poor fellow made for his life, and in his attempt to escape, threw away his belt, his cartridges, and what little money he possessed, expecting according to the customs of the country to return some day and find them again. But the men caught him, disarmed him, and gave him a most frightful beating with a whip. They soon saw from our faces that we did not approve of any such proceedings. Then began a series of discussions and negotiations, that lasted three days. We shamed our men for allowing

¹ Photograph, Prisoner and Sheikh.

a difference of perhaps a cent or two to issue in such a fracas. When they began to hedge, the fellow claimed to have lost two or three dollars in his flight, and they had it back and forth for hours. Hashim claimed the revolver, and declared his firm resolve to deliver the man to the prison authorities in Maan. But Maan was a journey of six hours away, and while Hashim was safe in our camp, he might have met other treatment by the way. Later on the Sheikh of Elji came down, and the conferences lasted most of the night. We held aloof until the *proper time*, and intervened to end the matter by releasing the prisoner and secretly assuring the Sheikh that the revolver would be restored, if they all kept peace during our stay. They promised faithfully, and they kept their promises, and we had nothing further to complain of. We mention this matter for several reasons. It was positively the only occurrence, from the beginning to the end of our trip, that might have ended unpleasantly. It was needless in every way, and would never have occurred had we been in camp. It may teach others the necessity of keeping a firm hand on the members of their caravan; for camp followers and even dragomen are in danger of presuming upon the power that is supposed to lie behind the travellers, and forget both wisdom and politeness in dealing with the people of such regions.

Toward evening a second soldier, a strapping fellow, mounted on a good horse, came into camp

from Maan. He had been sent in response to telegrams from Kerak, to the Governor at Maan, telling of our presence in Petra. He made himself useful, and his presence that night was of value in guarding our horses. The next day, however, we assured him that we needed no other guard than Hashim and our own men, and so after giving him a proper present and a polite letter of thanks to the Governor, we sent him on his way rejoicing.

When travellers speak of Petra being entirely encircled by its rocky rampart, it is not meant that this is one unbroken rocky ring. The eastern wall, continuing the wall of the Sik, is unbroken from Pharaoh's Treasury for fully two thousand yards, but breaks down somewhat at the extreme north-eastern corner of the valley, and here is where the Romans made a second road into the ancient city. The western wall is unbroken for fully two thousand yards, except where cut in twain, in the centre, by the exit of the brook. It is higher at the northern end, in the region of the Deir, and breaks down at the extreme southeast, and here also the Romans, by extensive cutting, carried their road out to Mount Hor, and on toward the Gulf of Akabah. Both the northern and the southern boundaries are deeply indented by the lateral fissures and ravines extending up into them. These fissures and ravines are filled with rock cuttings, but it is in the faces of the eastern and western walls that we find the most imposing monuments. Beginning at our camp, which was pitched near the ruins of the triumphal

arch, we will make a circuit of these rocky walls.

The photograph giving a distant view of the west wall (p. 105) shows the irregularity of the skyline. That marked Citadel Rock (p. 119) shows a completely detached mass encircled by ravines which drain into the exit of the Wady Musa brook. These latter ravines are exceedingly narrow and grand, and only careful examination reveals the fact that the Citadel Rock is detached on all sides. The general view west of camp, page 107, shows the northern end of Citadel Rock, and then a deep break, and here, hundreds of feet below the skyline, is the bed of the brook, and the exit already referred to. The northern continuation of the western wall is seen in the picture of the valley (p. 105) but mostly hidden by a mound covered by ruins, which is in turn separated from the wall by the deep valley leading to the Deir. No general view to the north was obtainable, except that from the High Place (p. 181), where this side lies to the left of the brook. The view marked "Exit" (p. 205) gives the general contour of the north-eastern corner of the trapezoidal floor, and the rampart, which is lower here than at any other point.

The eastern wall can be seen in its whole extent in the other view from the High Place, and it is covered with excavations from end to end. One of the best distant views is that on page 181, where this wall is seen from within the exit gorge, and across the whole extent of the city from west to

east. The view marked "Corinthian tomb, and temple" (p. 141) gives a closer view of the same section. Those marked "Temple in eastern wall" (p. 123) and "Tombs near inner entrance" (p. 115) carry us to the inner end of the Sik.

The southern boundary is bold and rocky near the Sik, and the mass in which the Treasury and the Amphitheatre are carved contains perhaps the most remarkable fissures and ravines of Petra, and is crowned by the High Place, whose details and magnificent approaches will be described in a later chapter. This mass is also detached on three sides, and is perhaps unapproachable from the side where it is joined to the main mass. The southeast corner of the trapezoid breaks down low enough for the exit of the Roman road so that in ancient times a traveller going towards the south could enter the city at the northeast corner and go out at the southwest, but both entrance and exit by this route involved climbing up and down some steep, rocky roads.

The floor of the ancient city, especially on both sides of the brook, is an endless mass of shapeless ruins, among whose debris are heaps of broken pottery and ancient roof-tiles an inch thick, like those found at Baalbec. Laborde and others have picked out the ruins of at least six temples, many bridges, large and small, and other massive walls, whose real character and use remain to be ascertained. It is almost certain that at one period the brook was arched over for two or three hundred

yards, and that the main public street of the Roman city ran parallel to it, or even at places immediately over it.

Along this main street were ranged most of the finest public buildings, and spanning it toward the west stood an arch of triumph. Parts of the side walls of this are seen in the photograph page 129. And here for more than fifty yards the ancient pavement is *in situ*. A hundred yards from the arch is the only structure of mason work standing in Petra, by some called a temple, but known among the people as Kasr Firaun, or the Castle of Pharaoh. The valley is the valley of Moses, but the Treasury and the Castle are named for Pharaoh. This building is thirty-four paces square and the walls are nearly entire. The front, which looks toward the north, was ornamented with a row of columns, four of which are standing. Back of the columns was an open piazza, which extended the whole length of the building. A noble doorway, not less than thirty-five feet in height, opened into the inner compartments. The picture on page 129 (Temple near Citadel Rock) gives a view of the eastern side of it, which is surmounted by a handsome cornice. The dark lines in the walls mark the groves into which the builders let huge beams of wood, apparently for the purpose of securing plates of metal, with which the edifice was once probably covered. The same arrangement is seen inside. This structure was not a temple, because it was divided into stories, whose stairways have now disappeared.

The walls everywhere seem to have been covered by plates of some kind for ornamentation. The timbers let into the walls have rotted away in places, but in others are still sound. We sorely desired to secure pieces of these, but failed through the lack of ladders and tools with which to cut off any sections. The ruins in the vicinity of this building will well repay the study of the skilled archæologist who can take the time necessary to master their details.

Immediately to the left of the Kasr, in the rocky wall, is seen the unfinished tomb so often referred to, showing that the ancients did their carving, as they did their quarrying, by working from the top downward. A hole at the base of this monument leads to a cavity behind the projected pillars, and a rude stairway ascends to the level where the workmen were engaged, when some change in the life of the city drove them away forever.

Not many yards to the left of this point is another object of interest—the Columbarium (see p. 137) cut into the solid rocks. The existence of a place of sepulture of this sort shows clearly that the people of Petra at some time burned their dead. This was probably during the Roman period. The dark opening in the centre of the picture is a doorway leading to another chamber, whose walls were covered with similar niches.

So much debris has fallen along this western wall, and especially below the ancient citadel, that the lower lines of excavation are almost wholly

destroyed or filled up and inaccessible. But it was here in the steep face of this rocky mass that we noticed some of the most brilliant of all the hues in the sandstone. Here, also, in a sheer precipice, can be seen the greatest variety of the strata, and when colored photography is perfected, this spot will yield some of the finest effects imaginable. We secured our best samples of the sandstone from this region, but here again we felt the lack of proper tools, and advise other travellers to carry hammers and chisels with them for this purpose.

In the photograph of the temple and western gorge is seen a small temple whose left door-jamb is broken at the bottom. A beautiful inclined way once led up to this spot. And inside this temple is beyond all comparison the most beautiful color effect we saw in Petra. The walls and the ceiling were arranged at such a level as to include the most brilliant strata in the mountains—a perfect quilt of ribbons, which wave like flags, swirl like watered silk, rising, falling, and producing the most wonderful effects. The traveller who fails to look in at this doorway has missed one of the sights of Petra. We would name this the Rainbow Temple. It is undoubtedly the ever busy action of the elements that keeps the coloring brilliant. In colder and damper climates a building whose stones are white and clean from the quarry soon loses forever its freshness and delicate natural colors. But in Petra the perpetual wearing away of the sandstone

keeps the coloring of the rocks and monuments as freshly beautiful as they were two thousand years or more ago, and will do so until they disappear.

A little to the north of this temple is another great carving which travellers have named the Corinthian Tomb, or Tomb in Three Stories. Where the cliff ends the tomb was carried up in courses of masonry. This has fallen into ruins, to the great damage and disfigurement of the appearance of the whole structure. One of the aqueducts brought its water to this line of monuments. The space in front of them was one of the plazas of the city. From this spot we saw one of the Mazzebah pillars of the High Place, standing out against the skyline like a church steeple. This vicinity was plainly the centre of the greatest wealth and beauty in Petra. Being the eastern wall, it has caught the force of the storms which come from the south and west, and shows more clearly the decay and destruction wrought in the lapse of centuries.

The most imposing monuments after the Treasury and the Deir were carved in this eastern wall. The lack of any elevated vantage-point makes it difficult to get any near views of them. The view taken from inside the western gorge (p. 193) gives a distant view. That marked "Temple in eastern wall" takes in a large expanse, including one of the great temples, which in its glory must have been very impressive. The cutting in the rock is even now more than sixty feet wide and

deep, and this platform was greatly extended city-wards by enormous sub-structures, like the platforms in Jerusalem. These arches have mostly fallen, but their outlines and debris are enormous. The height of the cutting in the face of the cliff at this point is more than a hundred feet, and the rooms hollowed out are reached by stairways inside the rock.

In some of the tombs the floors were perfectly level, as they were when first hewn from the rock, in others we found a series of rectangular openings ranging from twenty inches to two feet in depth, and varying in size according to the dimensions of the body to be buried. The floors of several tombs which we visited were completely covered by such openings, whereas in others there were but one or two. All of these tombs were quite empty. At some time they were covered with stone slabs, which had been cut to fill a step-like ledge around the upper edge of the grave. Many of the fragments of the covers of these openings were found, but none of them were inscribed in any way.

Our camp was set among the ruins near the Kasr and the arch; behind us was a slope covered with the debris of the city; another mound across the brook was also a shapeless mass. Back of these ruin-covered slopes, and on either side of us to the east and west, rose the enchanting cliffs, carved by ages of wind and storm. Over all, the decaying hand of time has spread a crumbling mantle, half revealing, half concealing their indescribable

beauties. Add to this impression the utter loneliness and desolation, with not a sight or a sound that even faintly recalls any object or event within a thousand years,—and, between the sunset glories and the clouds flying over this scene at night, one has room for sensations as strange, as weird, and as enchanting as one can hope to experience on this curious earth of ours.

CHAPTER VII

THEATRE—FAIRY DELL AND HIGH PLACE

BY Monday, we had made every preparation for careful exploration, and decided to attack the detached mass lying at the inner end of the Sik, standing, as it does, almost in the heart of the ancient city. On its eastern flank is the Treasury of Pharaoh, and the great amphitheatre ; into its heart extends one of the finest fissures of the valley ; up its sides wind at least three of the famous rock stairways, each bordered with endless excavations, and on its summit the cathedral of ancient worship—the High Place of Edom. Musa, our guide, was on hand early, and loaded with camera, plates, and rifles we left camp, and swinging round the ruins south of the brook we came at once to the inner end of the Sik.

The view of the tombs near the inner entrance will give an idea of the way in which the eastern wall is honeycombed at this point (p. 115) and shows one of the finest carved masses in Petra. From the floor of the valley to the sky-line there was some tomb or monument in nearly every stratum, while to the left of the centre appears the



PETRA—AMPHITHEATRE

enormous cutting of the great amphitheatre, and above it towers the peak on which was carved the High Place. A nearer view of the amphitheatre will give a clearer idea of its size, especially when one finds the individual who stands gun in hand among its rows of seats. This theatre is a strange and unexpected sight in this Appian Way of Petra; with tombs on every side and even above it, this pleasure resort is hewn from solid rock, and one is forced to make the astonished comment, "Amusement in a cemetery! a theatre in the midst of sepulchres!"

The diameter of the floor, or stage, is one hundred and twenty feet, around which rise thirty-three rows of seats, so well preserved that an audience might easily take their places to-day and watch whatever tragedy or comedy the wandering Arabs might act on the level floor below. Burckhardt estimated it as accommodating three thousand persons, but we estimated from our measurements that fully five thousand spectators could have been seated in it when the tiers of seats were complete. The excavation from the floor to the edge of the cutting above is considerably over one hundred and thirty feet, and more than three hundred feet from side to side. Here also the coloring of the sandstone is brilliant, and at certain points in the excavation the tiers of seats are literally red and purple alternately in the native rock. Shut in on nearly every side, these many-colored seats filled with throngs of brilliantly dressed revellers, the rocks

around and above crowded with the less fortunate denizens of the region, what a spectacle in this valley it must have been ! What an effect it must have produced upon the weary traveller, toiling in from the burning sands of the desert, along the shadows of the marvellous Sik, past the vision of the Treasury, and into the widening gorge that resounded with the shouts of the revellers, and reverberated with the applause of the populace, in the days of its ancient glory !

“ To me,” wrote Stephens many years ago, “ the stillness of a ruined city is nowhere so impressive as when sitting on the steps of its theatre : once thronged with the pleasure-seeking crowds, but now given up to solitude and desolation. Day after day these seats had been filled and the now silent rocks had re-echoed to the applauding shouts of thousands ; and little could an ancient Edomite imagine that a solitary stranger, from a then unknown world, would one day be wandering among the ruins of his proud and wonderful city, meditating upon the fate of a race that has for ages passed away. Where are ye, inhabitants of this desolate city ? Ye who once sat on the seats of this theatre, the young, the high-born, the beautiful, the brave ; who once rejoiced in your riches and power, and lived as if there were no grave ? Where are ye now ? Even the very tombs, whose open doors are stretching away in long ranges before the eyes of the wondering traveller, cannot reveal the mystery of your doom ; your dry bones are gone ;



165 PETRA—ON THE ROAD TO THE FIRST HIGH PLACE
 NEAR THE TREASURY

the robber has invaded your graves, and your very ashes have been swept away to make room for the wandering Arab of the desert."

Again we passed into the defile whose rocky banks are strewn with the fragments of the ancient city ; again we gazed upon the tiers of the rock cuttings, the broken stairways, the ruin wrought by masses shaken loose by the earthquake, until we stood spellbound once more in front of the Treasury. Each visit seems to enhance its beauties, and deepen the charm of its silent glories—its power was the same but changed, as seen at sunrise, at sunset, in the shower, or in the blaze of noonday.

None of the guide-books or records of former travellers had spoken of a road leading up the fissure to the left of the Treasury. The dense growth of oleander in the floor of the opening and the trees and bushes among the rocks hide one of the most charming bits in Petra, which we named the Fairy Dell. Later in the day the shadow of the cliff fell across it and so it was our lot to take this morning view or nothing. A glance at the picture will show on the right the cliff into which the Treasury is carved, and on the left the mass at the end of the Sik, while in between rises the dell, which is more like fairyland than anything we ever saw in our childhood dreams. It is a promontory between two fissures, and the mass of iris-hued and fantastic sandstone between the rifts was cut into a maze, where we found cascades, stairways, platforms,

seats, and sheltered nooks. For a height of nearly two hundred feet, all is now overgrown with clinging plants and bushes. The edges of the sandstone, worn by wind and water, have melted into shapes most beautiful, with colors soft, sweet and harmonious—a most exquisite bit of landscape gardening, with all the colors of the flowers, and yet in solid stone ! We saw it just at the right time, —after the showers, when the ancient pools and channels were filled with water, and the little cascades came tumbling down the rocks and enhanced their beauty.

As we climbed the ruined stairways, and saw everywhere the marks of human handiwork, in the nooks, the channels, the pools, the little tunnels, the seats, arranged to command the valley and the Treasury below, we marvelled at the taste, the ingenuity, and the skill of those ancient races who, entering this wildest of Nature's fastnesses, proceeded to subdue and refine its beauties until it must have been, as it certainly is still, one of the most charming spots that the eye of man has ever rested upon.

As we climbed higher and lost sight of the dell, the pathway broadened into a road that we felt must lead to something of importance. At one point the roadway was cut for a hundred and fifty feet through a shoulder of the rock, ten feet wide, and with a depth varying from five to fifteen feet. At places the action of the weather had completely destroyed the old path, but we followed its line



169 PETRA—ON THE ROAD TO THE HIGH PLACE—QUARRY AND PYRAMIDS

Theatre—Fairy Dell and High Place 171

until we were fully five hundred feet above the level of our tents. We made our way across the top of the mass in an easterly direction, and soon came upon another roadway coming from the vicinity of the theatre, through a great cutting, and after joining they pass on to the base of the famous "mazzebah" or pillars, which mark the ancient High Place of Edom. The picture (p. 169 mazzebah) gives an excellent idea of the spot. The eastern pillar is five feet by five and a half feet at the base, and twenty-four feet high. The westerly one is ten by six feet, and twenty feet high. They were not built, but were formed by cutting the native rock away from around them. The whole amount of cutting which took place in this region is tremendous.

The process of quarrying was evidently still being carried on here when it was stopped by some violent occurrence. Directly in front of the nearest pyramid, in the picture, can be seen a number of rectangular lines, now marked by a growth of weeds and grass, where blocks of stone have been outlined, preparatory to forcing them loose by wedges. Some blocks had been loosened, but had not been taken away; others were still connected with the main mass. The fine grain and delicate color of the rock in this quarry must have been the reason for the demand made upon it. It appeared to have been used in the construction of the Kasr Firaun. In color and texture it resembles the famous Carlisle sandstone. The whole face of the

great cliff in the centre of the picture must have been cut away in this manner.

Immediately across the great roadway, on the top of the highest point, are the shapeless ruins of a building that was once fully a hundred and fifty feet long. To the left of this building, and opposite the mazzebah, is another cutting which seems to have formed a grand staircase, leading up behind the large building to the very summit of the rocky mass, where we found the object of our search—the most ancient High Place.

Our camp in Petra was about three thousand feet above the sea and our barometers registered thirty-seven hundred at this point, or seven hundred feet higher than the floor of the city about the brook. The first view of the High Place, to one approaching it from this direction, is that of the sunken court, which is forty-seven feet long and twenty feet wide. In its centre, cut from the native rock, is a small raised platform, four feet ten inches by two feet seven inches, and four inches high. The whole court slopes perceptibly to the east and south, and was drained through a cutting at the southeast corner.

The second view (High Place—Altars) gives the arrangement of the pools, the two altars on the west side of the sunken court, with the raised platform immediately in front. On the left is a pool cut into the rock five and a half feet long and about sixteen inches deep. To the right of it and between it and the steps, is another smaller cavity,



PETRA—COURT OF THE FIRST HIGH PLACE

hollowed out and connected by a channel with the round altar just above it (see Plan, p. 97). The round altar is formed by two concentric depressions cut into the rock, the outer one being forty-six inches in diameter and the inner one seventeen inches. If this was the spot for slaying the bloody sacrifices, then the blood would run down and collect in the cavity close to the stairway.

The other altar is a detached rectangular block, nine by six feet, with the passage-way all round it. It is approached by the stairs seen in the pictures and plan, and, in addition to the strange cuttings on the corners, contains a depression forty-three inches long and four inches deep, possibly for libations, or parts of the burnt offerings. At the northern end of the sunken court is a cutting that seems to have been intended for a seat accommodating at least ten persons. Thirty feet south of the southern end of the court is a large pool, seven feet eight inches by ten feet, and three feet deep, cut into the solid rock.¹ The worshipper or priest who ascended these altar stairs, and then turned to face the court, found himself looking towards the rising sun.

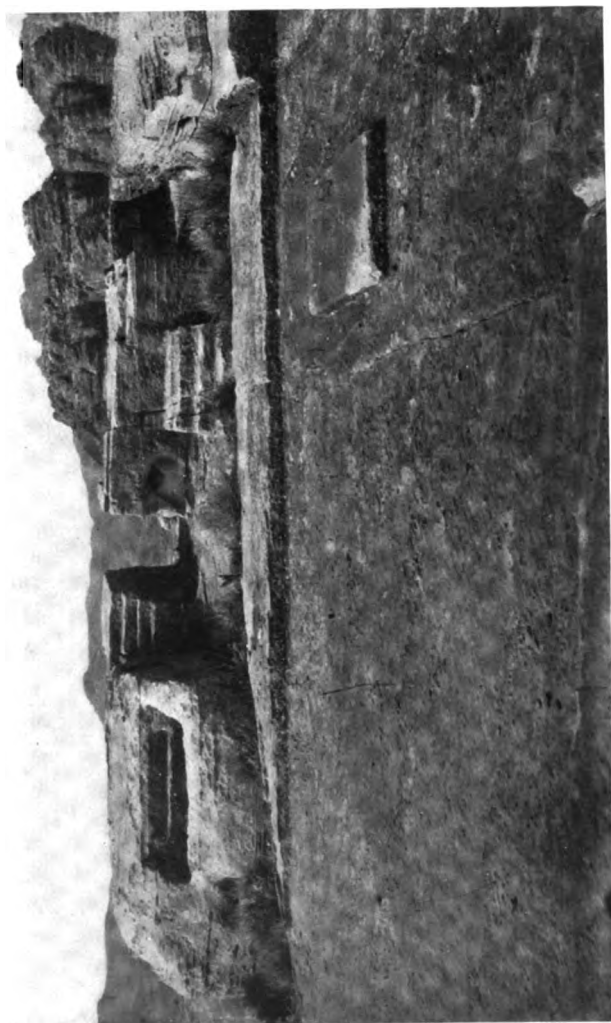
We had carried with us the *Biblical World* for January, 1901, and carefully re-read Professor Robinson's article, "The High Place at Petra in Edom," on the spot itself. We are convinced that the altars, pools, and stairways are an ancient piece of workmanship, and most certainly intended for the

¹ For a more detailed description see *Pal. Exp. Quarterly*, S. I. Curtis.

purposes of worship. We noted also that while Petra is cut into the lower strata of the friable red and white sandstone, this particular peak reaches in its summit the harder strata which appear everywhere in the plateau and mountains round about. This fact alone probably explains the excellent preservation of this monument of antiquity, for had it been hewn in strata similar to that of some of the crumbling sandstone of the city below, it would not have been distinguishable after the lapse of so many centuries. This layer of harder rock has acted as a roof to the whole peak. There is plenty of crumbling red sandstone two hundred yards away, and only fifty or sixty feet lower down, but the cap in which this High Place is preserved is of harder consistency. Comparing the weathering on this rock with the other ancient buildings and cuttings in Syria, there can be no doubt as to the very great antiquity of this record of past ages.

As to the outlook from this peak, it is sublime, and worthy of a place among the noted mountains of the Bible, and marvellously fitted to stir within the human heart those emotions which have ever found their rightful vent in the worship of powers far above all things human.

As to location, it is much more central than other explorers have realized. We have described the impressive pathway leading from the Treasury through the Fairy Dell to this spot. We have noticed the roadway coming from a point in the valley south of the theatre, and still another stairway came



PETRA—ALTAR OF THE HIGH PLACE

from a point west of the theatre. We attempted to descend this path, but found it impossible without ropes and ladders, though the remains of the ancient stairways are visible at a dozen points. The photograph marked "Descent from High Place" (p. 185), looks down this fissure, and was taken from a spot near where the photograph of the inscription on the road to the High Place was taken. To the left of this inscription is a rude cutting of an altar approached by stairs. In addition to the *three* approaches named, there was still a fourth, coming from the southwest. This was a longer and hence easier approach than any of the other three. It was bordered for hundreds of yards with fine cuttings, in one of which is still to be seen a well-preserved inscription in the Nabathean characters.

Three separate inscriptions are visible on the rock in the picture.

The upper one on the right is partly concealed in the photograph by the foliage: the ends of the two lines consist of the words—

—his son
—his daughter.

A lower inscription on the right is also partly concealed by the foliage and discoloration of the rocks. The portion that is visible reads

Remembered be Kayyâmat, son of—

The upper central inscription is almost entirely

legible; certain letters which are in doubt are indicated by underscoring them. The translation is:

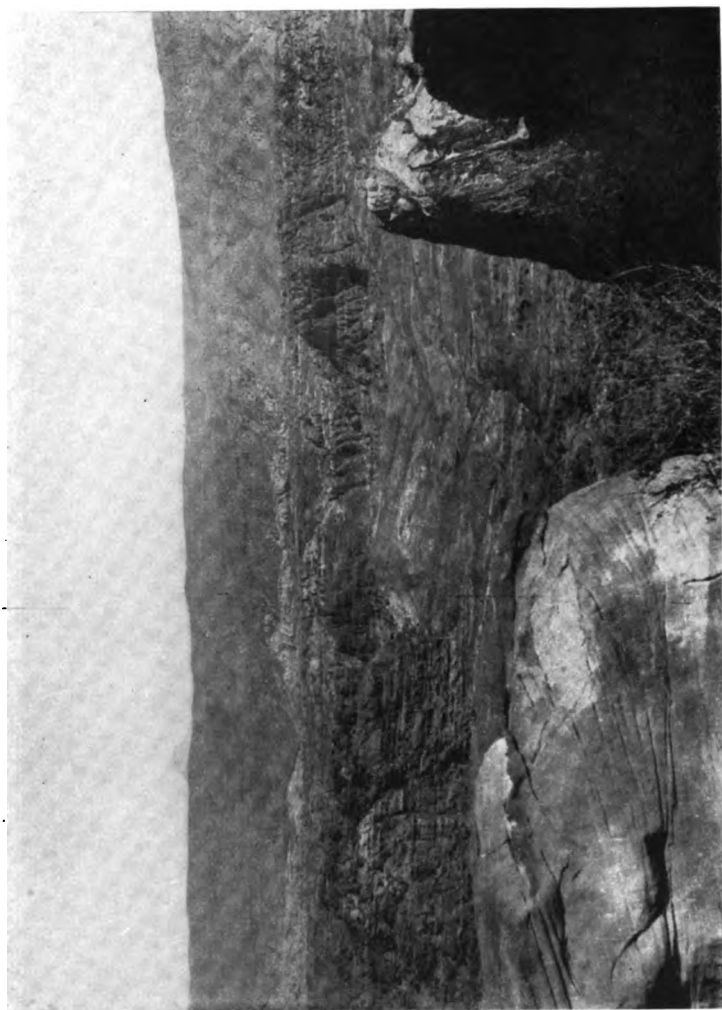
Remembered be Hayyu, son of Bâlitu, in goodness and peace before Dûsharâ.

The inscription is similar to hundreds of others in the region, cut in the rocks by men who had abundant leisure, and wished to perpetuate their names.¹

The position of this High Place, within the ancient capital of Edom, its magnificent central location, its four main approaches hewn from the solid rock, with their endless excavations, carried by cuttings and stairways around and up towering cliffs, three of which roadways unite in front of the "mazzebah," and then make the remainder of the ascent by a colossal stair to the High Place itself—these facts easily establish its claim to being the chief place of worship, the cathedral rock of ancient Edom.

From the days of Abraham to Solomon, the Bible makes many references to the worship on the high places. It was a natural and at first an innocent impulse, which led men to resort to the hills for worship. There the worshippers were brought nearer to the heavens, and the separation of those retired eminences from the scenes of the usual routine of daily occupation suggested the idea of sacredness. Sinai, Hor, Nebo, Ebal and

¹ We are indebted to Professor Davis of the Princeton Theological Seminary for this translation.



181 PETRA—VIEW OF SITE OF CITY FROM THE ALTAR OF THE HIGH PLACE

Theatre—Fairy Dell and High Place 183

Gerizim, Ramah and Jerusalem, play an important part in the history of the religious life of the Children of Israel. The literature of other nations, and their attempts to build in the low-lying plain structures that would imitate the mountain heights bear testimony to the same impulse and instinct.

Leaving the fuller discussion of the more recon-dite questions as to how far the Israelites, coming from Egypt, were influenced by the example of the Moabites and Canaanites to wider and later study, we may point out briefly some of the matters that come into prominence. That these spots were for worship, and not for ceremonies connected with the burial of the dead alone, is evidenced by the elevated location of the main High Place in Petra, and the absence of tombs anywhere within hundreds of yards of it. That the worship included the element of sacrifice is proved by the accessories of all such well-preserved locations. That they reproduce in a striking manner the main features of Israel's tabernacle,—the sanctuary, the court, the lavers, the altars, etc., is undeniable. Now, whether the Israelites borrowed from the Moabites, or the Moabites from the Israelites, or both from another source, is of course an interesting question; but one of the plainest and most valuable inferences lies on the surface and is this,—these high places bear the strongest testimony, along with older references in literature, to the great age of the idea and practice of sacrifice, pushing it back into the earliest periods. Whether it was animal or

human, or both, will perhaps some day be known more fully.

In the reign of Solomon we are suddenly confronted by an unusual development of the worship on high places. It was one of the sins of this great King that he burnt sacrifices on so many of these high altars. His foreign wives induced him to build high places for "Ashtoreth, the abomination of the Zidonians ; for Chemosh, the abomination of the Moabites, and for Milcom, the abomination of the Children of Ammon" (1 Kings xi., 17 ; 2 Kings xxiii., 13). In spite of the construction of the Temple, this idolatrous worship introduced from foreign nations, and the *worship of Jehovah* on high places went on increasing for many years. The conflict between the two is suggested in Solomon's days. Elijah complains that the altars of God are thrown down and neglected, and he himself burns incense on the reconstructed altar on Mount Carmel. This conflict grew sharper in the day of Asa and the kings who followed him, until the impression is sharply defined that all the worship on these high places was idolatrous and hence illegitimate. Then followed the centralizing of worship and sacrifice at the one altar in Jerusalem, and the warfare waged against all the high places in the Holy Land. The reasons for this are not far to seek. The ritual and worship at these myriad local altars, after Solomon's accession, degenerated from the older and simpler standard, and their heathen practices had been



PETRA—DESCENT FROM THE HIGH PLACE

introduced into the city of Jerusalem itself. Any reform in Jerusalem must needs have issued in a warfare against all the local shrines. Hence the interesting fact that to find the mazzebah and other accessories of this worship on high places we must go to Edom and other portions of Syria, which lay beyond the sphere of the Jewish kingdom's influence and control. And here in Petra are certainly the most perfect specimens of these interesting remains of the centuries before the monarchy and perhaps the Exodus.

Two other features of these ancient high places, connect them curiously with our religious life of to-day. The ancient worship in Petra embraced the double altar of their matchless high place.

The other connecting link is the relation between the pillar or the pillars, marking the location of these ancient places of worship, and the minaret and church steeple. It does not require a great stretch of imagination to connect this pillar with the minaret of Islam and the steeple of the Christian church. The Mohammedans added a winding stair, like the approaches to the ancient high place, and a human voice to call men to prayer; while the Christians added a bell or a set of chimes. The Jews, curiously enough, enjoined and urged the destruction of all the groves and "pillars" and accessories of the "high places," and they did not leave one pillar standing west of the Jordan. They never seem to have built

anything corresponding to the minaret or the church steeple in connection with their synagogues.

Christian church architecture has also decreed that the altar shall face the east, as the altars of the High Place at Petra do, but with this important change: the sunken court at Petra lies to the east of the altars, while in Christian cathedrals the nave lies to the west. All the sun temples, however, follow, of course, the order of the High Place in Petra. The temples at Baalbec, and at thirty other places in that region, invariably face the east, the rising sun entering the opening door and lighting up the altar which stands against the western wall. The Jews afterward opened their windows and prayed toward Jerusalem, and the Moslems, no matter where they may be, pray toward Mecca. It remained for evangelical Christianity to shake itself free from the points of the compass, from Jerusalem, from Rome, from human traditions of every sort, from all created objects, and lift its face and heart heavenwards in the worship of God in spirit and in truth.

NOTE—The High Place was seen by Mr. E. L. Wilson and party in 1862. Described by Prof. S. I. Curtis, who visited it in 1898. See also Prof. G. L. Robinson's article in the *Biblical World*, January, 1901.



NUBATEAN INSCRIPTION

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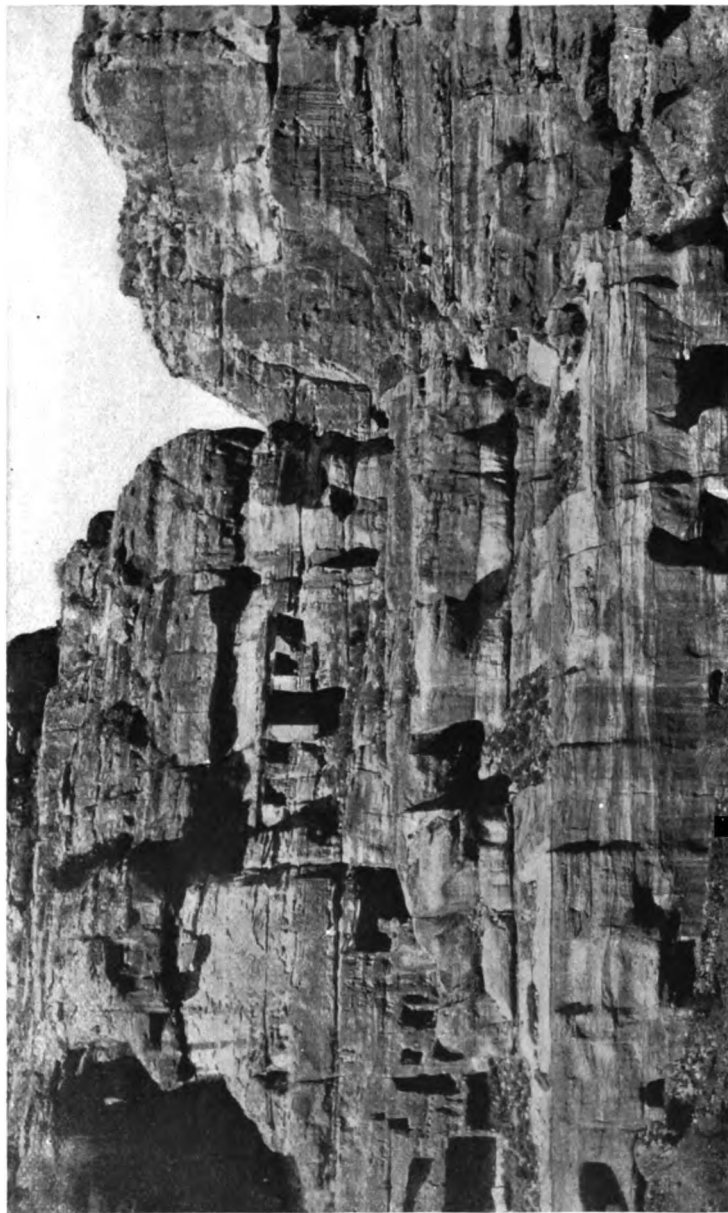
CHAPTER VIII

THE SECOND HIGH PLACE AT PETRA

THE next day we had the pleasure of discovering a second "high place." Early in the morning we climbed to the top of the "Citadel Rock" by a badly ruined road and stair; and, while examining the ruins of what seems to have been a small Crusader fortress,—for a band of Crusaders once entered Petra,—we saw in the gorge below, right behind the "Citadel," cuttings which recalled the original high place. An hour or two later, we made our way to the location, and found all the accessories of a second "high place," in one the grandest and wildest spots about Petra.

The main street and brook in Petra run from east to west, as pointed out in a preceding chapter (p. 118). On the eastern side of the city stand the Corinthian tomb and a great temple. Toward the west, the main street passes through the Arch of Triumph, in front of the Kasr Firaun, and then by a gentle incline upwards runs towards the base of the "Citadel Rock," which was one mass of tombs and carvings. From the "Kasr Firaun" to

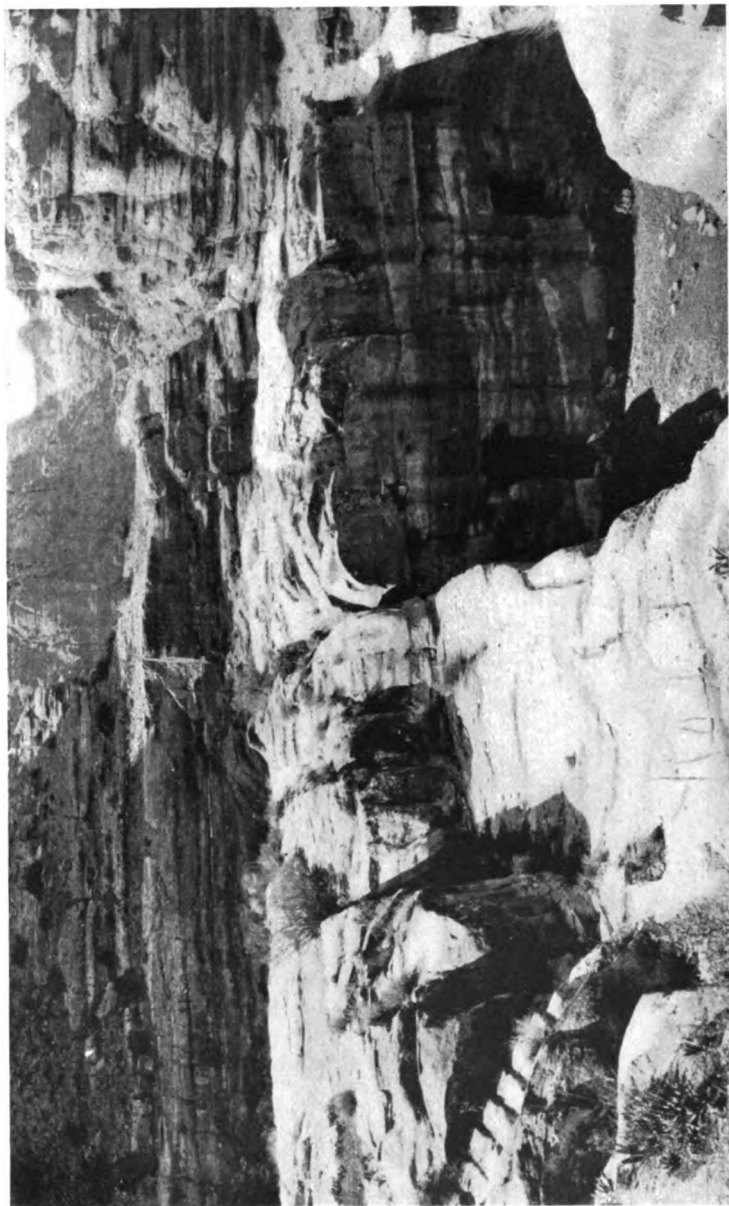
the base of the Citadel, it is some seventy yards to where we found the ruins of an inclined way, with here and there broad steps, leading up to the "Rainbow Temple," which was formerly and is still, one of the most beautiful objects in the valley. This fine inclined road is broken in places by the falling in of the caves and tombs beneath it, but soon after passing the "Temple," it winds round the northern base of the Citadel Rock, and into the exit gorge, by a gallery cut into the rock, from four to ten feet wide, with a solid rock balustrade, at places six to seven feet high. This gallery where it enters the gorge, which at this place is about sixty feet wide, is some fifty or sixty feet above the floor of the brook. It then continues around the Rock, with a width varying from three to fifteen feet, for a distance of over two hundred yards, until it comes to an open platform of rocks (see photograph of the vicinity of the second high place), sixty feet above the floor of the brook, where another valley from the south joins the gorge. Here we reached the altar. Towering rocks two hundred to four hundred feet high surround the weird spot on every side (see views of rocks round high place and rock architecture). Standing on the point beside the altar, one looks back through the narrow gorge, and across the city to the Corinthian tomb (view of lower gorge—looking west from new high place), down the gorge into an abyss, and through a cleft toward the east one might see the rising sun. The open space is perhaps five hundred feet



PETRA—RAINBOW TEMPLE, AND ENTRANCE TO WESTERN OR EXIT GORGE



PETRA—BALUSTRADE ON THE PATH TO THE NEW HIGH PLACE



PETRA—NEW HIGH PLACE

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square, and the rocky walls on every side contain hundreds of tombs and rooms carved into the sandstone. While not more than five hundred yards away from the Arch of Triumph, one might imagine that he had gone a day's journey into the heart of the mountains. At least four large stairways, six to ten feet wide, ascend from the valley below to the platform, in addition to the gallery leading from the main street of the city.

And here, as in the High Place above, are all the accessories of worship. The altar faces the east (see plan—p. 97). In front of it is a sunken court, seventeen by eighteen feet, with a seat around it with a natural rock back. Immediately contiguous is a second and lower sunken court, now a grass plot because filled with soil, ten by twenty-two feet, and beyond that a still larger cutting in the rock, making another court eighteen by twenty-one feet. At the southeast corner of the grass plot a large piece of the natural rock is left, and in it is cut a pool, three and a half feet long by two feet wide, and some eighteen inches deep. In the bottom of the pool is a smaller cavity, and fitting snugly into it is a stone plug. To the right of the pool is another small platform, measuring eight by ten feet, which appears to have been once roofed over by the natural rock. Above the pool and platform, on the great rock, and some forty feet away, are the remains of a large pool, seven by eight and a half feet, which, instead of being hollowed down into the rock, was made by cutting the rock away and leav-

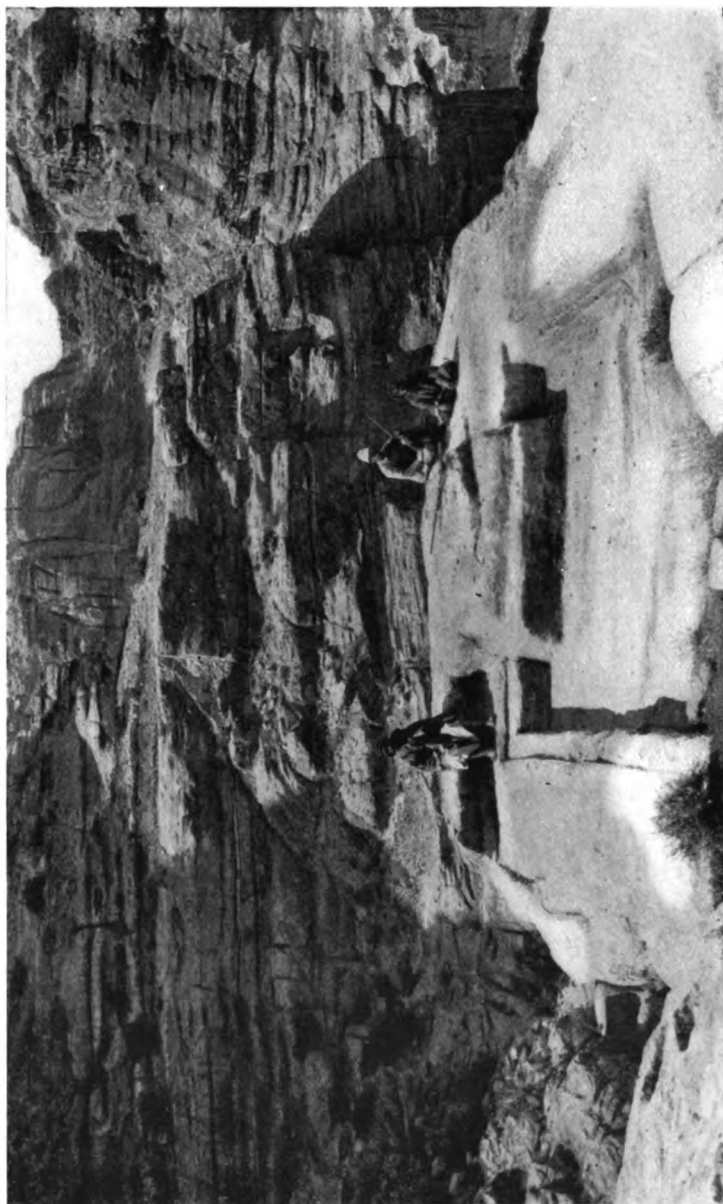
ing the box-like pool standing above the rock. While much worn by wind and rain, one corner still shows a height of thirty-four inches above the rock.

Not far away from the large pool are two circular cuttings in the rock, six to twelve inches deep, similar to the round altar in the main High Place. The photographs, p. 197 *et seq.*, will tell the rest of the story.

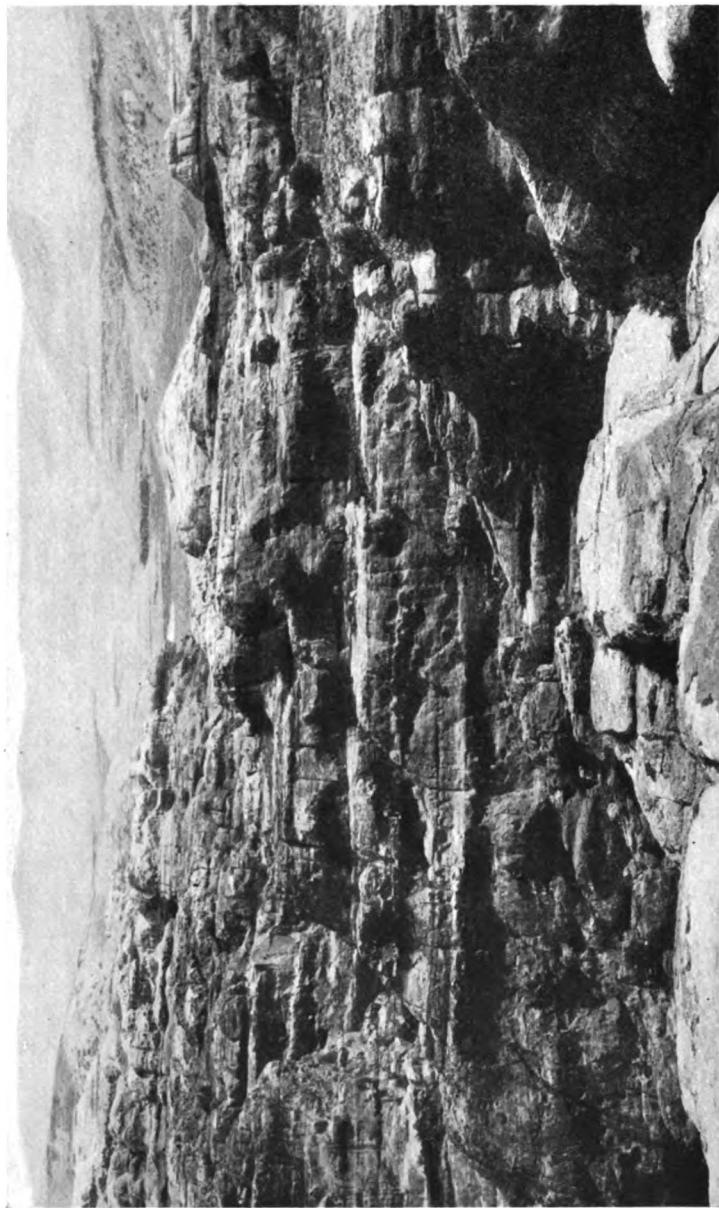
To sum up we have in this location:

1. An altar, much worn, but with one libation hole still visible.
2. A court, with seats around it, with the remains of a back-rest, of the natural rock.
3. A grass plot, most likely a lower court, or an extension of the altar court.
4. Rock cuttings to enlarge and extend platforms.
5. A small pool in the rock, with a round cavity in the bottom.
6. A recess near by, once roofed over by the original rock, as a shelter or receptacle.
7. A large pool, or laver, near at hand.
8. Four stairways, and a gallery leading to the spot; two stairways at the rock, and two other fine ones within a hundred and fifty feet.
9. Tombs in the high rocks all around the locality.

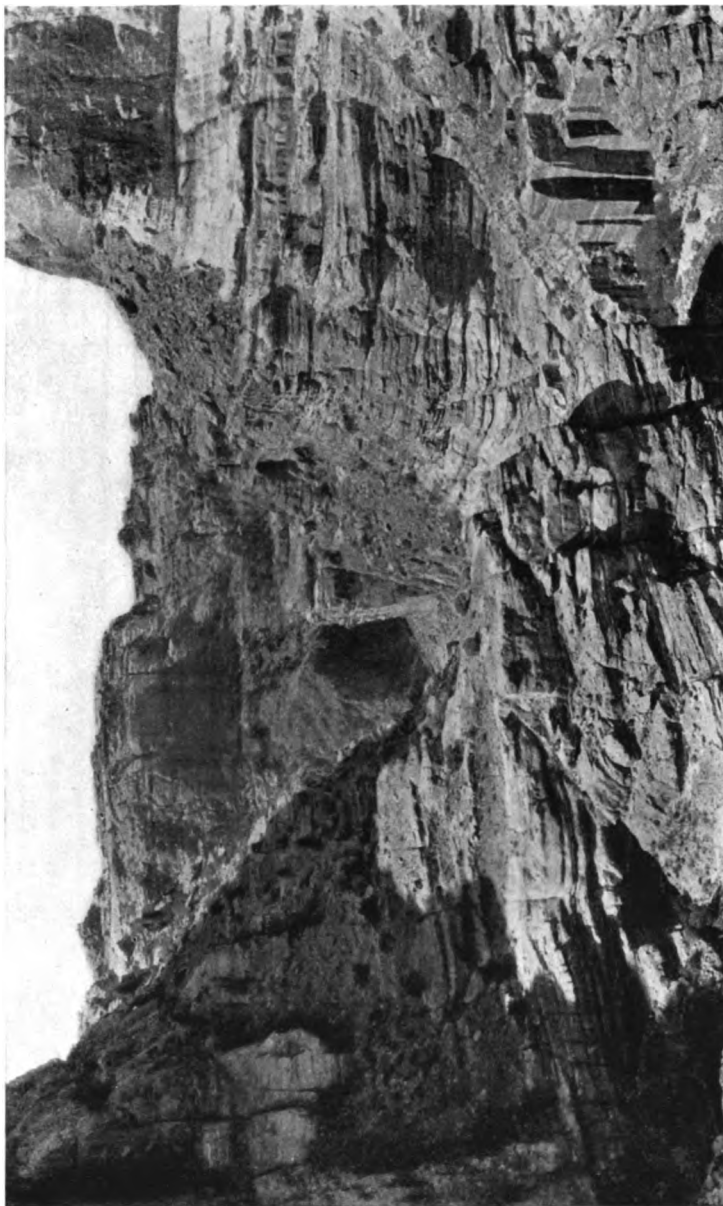
That it was a public gathering-place is evident from the various approaches, wide enough to accommodate any formal procession. That it was intended for worship is almost as certain. That it belongs to the centuries before the Christian era



PETRA—ALTAR IN NEW HIGH PLACE



PETRA--LOOKING EASTWARD FROM CITADEL ROCK OVER SITE OF NEW HIGH PLACE



PETRA—WESTERN GORGE FROM NEW HIGH PLACE

is evident from the numberless considerations drawn from the history of the city and region.

The more we explored, the deeper grew the conviction that similar places of worship will yet be found in other parts of the city and its surrounding rocky rampart. Up at the place called the Deir, we saw many rocks circled with stairways reaching to their summits. These stairways are in most cases worn away in places by wind and weather, making it difficult to mount these isolated rocks. It may possibly be that the main high place was the "Cathedral" of the city, and the second high place a sort of winter church, much easier of access, the same arrangement being found in the case of the "sun temples" of Northern Syria, which are frequently arranged in pairs, one high above the city or village on a mountain-top, available in summer for the purpose of worship, and a second structure, in the town itself, accessible in the colder and stormier days of the winter.¹

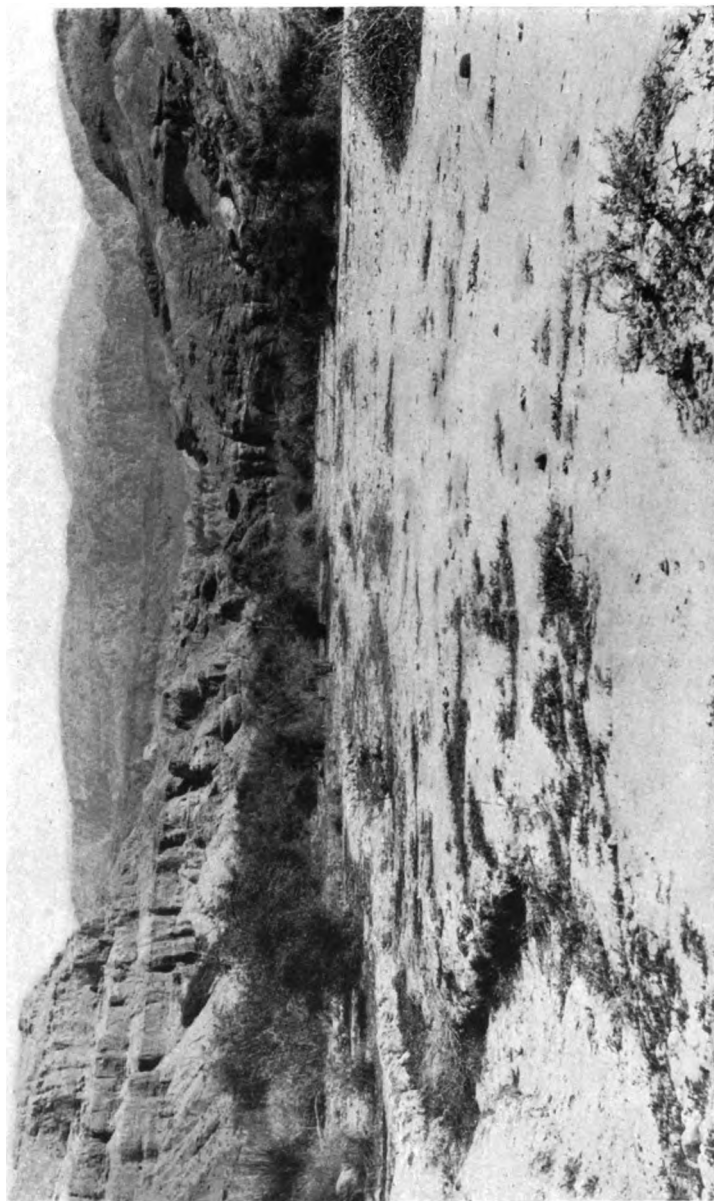
¹ As seen at Bludan, Niha, Hadeth, and Baalbec itself.

CHAPTER IX

THE DEIR

FREQUENT reference has already been made to the many fissures or ravines which extend from the floor of the valley up into the heart of the rocky walls of the city. We have noticed three in connection with the High Place, but the northern wall of the amphitheatre is indented with at least half a dozen of them, as yet largely unexplored. But the most remarkable and by far the most interesting one is that leading to the Deir. It lies close against the northern half of the western wall, and after running due north for some six hundred yards, it turns at right angles and extends nearly due west for another eight hundred yards. The winding path and stairways would stretch perhaps twice this distance, since the elevation of the Deir above our camp was more than seven hundred feet.

Leaving camp we crossed the brook at the mouth of the exit gorge, and turned up the bed of a torrent more than a hundred feet wide at its point of juncture with the gorge, but narrowing rapidly until one could almost touch the walls on each side



PETRA—A LATERAL VALLEY FROM THE SOUTH

with the outstretched hands (photograph, Road to Deir, p. 215). Then we left the torrent bed to ascend a staircase hewn out of the rocks. The steps are not continuous, except at steep places; here a flight of ten, then a curving incline, then a flight of forty; sometimes the steps are a series of platforms, placed four and five feet apart, and then they mount as steeply as the pitch of the ascent demands. Often it is ten feet from side to side of the roadway, and passing through the various strata the colors include all that can be seen or found in Petra.

The ascending road winds past beautiful nooks, where the seats and niches and cuttings rival the Fairy Dell, as seen in the photograph, p. 165 (Ascent to Deir); then along the brink of a precipice, below which is a fissure almost equalling the Sik (Road to Deir, Looking West). At places a balustrade of the natural rock has been left, but at others we looked directly down into the yawning abyss. For nearly the whole of the distance the cliffs and little side fissures are filled with numberless excavations. Stairways seem to run everywhere, some with no beginning, some with no ending, leading to caves that have crumbled away, or to the top of rocks now inaccessible. Again, we noted the little channels and pools to catch the rain or to convert its flow into miniature cascades, which added an artistic charm to the pathway.

At one point we saw an extensive system of channels and pools, in which to catch and store

the precious rain-water. Here, as everywhere else in Petra, the winds and the storms have eroded the colored sandstones into ten thousand curious shapes, and everywhere thrown a veil of decay over the cuttings and chisellings that enhance the charm many fold. It is another journey up into fairyland.

At length the road made some final curves among the boulders of the white strata of sandstone and emerged in the wide plaza of the Deir, a sloping space many hundreds of feet from side to side, and surrounded with the same fantastic rocky tops that appear everywhere above the Petra mass. At the right of the road as it enters this square, and on its lower side, stands the second great monument in Petra, called the Deir or monastery (photograph, p. 225). It is carved from the side of a mountain-top, but not protected by any overhanging mass. It is larger than the Treasury, being a hundred and fifty-one feet wide and a hundred and forty-two feet high,¹ but not nearly so fine in coloring or design. It is impressive in its size, in its surroundings, but it cannot be called beautiful. Stanley compares it with a London church of the eighteenth century, massive, but in poor taste, and with a somewhat debased style of ornamentation. Like the Treasury, it is in two stories, and surmounted by an urn and ball of stone. The five niches may once have contained statues, but these decorations, if they existed, evidently were not carved from the native rock.

¹ Hornstein's figures.



PETRA—ROAD TO THE DEIR, LOOKING EAST



ROAD TO THE DEIR--THE STAIRWAY

A colossal doorway, thirty feet high and seventeen feet wide, opens into the single large room, carved in the rock behind it. Like the room at the Treasury, it is nearly a hollow cube, measuring thirty-six feet nine inches by thirty-nine feet eight inches. At the north end of the room, opposite the doorway, is a recess carved in the rock, fourteen feet wide by eight feet deep, and is approached by steps from either side, which lead to its floor. It is raised four feet above the floor of the main room. Travellers have called this an altar for a Christian church, and there is good reason for accepting this explanation, since the Deir has certainly served such a purpose at some period of its history.

The "Deir" means the "Monastery," and the existence of this name is a pretty positive clue to a time when Christians inhabited Petra. Mohammedans at the time of their invasion honored Pharaoh and Moses in the new place-names for Petra, and completely ignored the Horites, the Edomites, the Idumeans, and the Romans. It is just as certain that they never, of their own accord, gave the name of a Christian place of worship to any spot. They must have found the name of "monastery" clinging to the building when they entered and took possession. Nor did the Mohammedans ever carve the altar-like recess, and it is also certain that Christians have not permanently inhabited Petra since the time of the Mohammedan invasion. The city was occupied by Baldwin I. of Jerusalem, and formed the second fief of the barony

of Krak (Kerak), under the title of Château de la Vallée de Moyse or Sela. It remained in the hands of the Franks till 1189, and the statement exists that as late as 1217 there was a small monastery on Mount Hor. But quite likely in the days of the Christian occupation of the Madeba plain, and the hallowing of such sites as Nebo, Christian men did not forget that not far off Aaron slept on Mount Hor; and the view from the upper edge of the plaza, where this monastery stands, commands the finest possible view of Aaron's grave and mountain, just across the yawning chasm which carries the Wady Musa brook from Petra toward the Dead Sea.

But the original purpose of the plaza and its vicinity, whatever its name may have been, was that of a great pleasure resort. Immediately in front of the Deir, on what is almost a greensward, we traced the circle of a theatre, which had a back wall of masonry and several rows of seats. The circle is still plainly marked. No matter what the state of the country may have been outside the valley, while the city guards held the strong entrance of the Sik the whole of the inhabitants of the wealthy city could climb the rocky stairways and make holiday here in absolute security from every enemy. As far as we can see or learn, the spot is wholly inaccessible, except by the one rocky stairway and winding path up which we came. Again we were impressed by the taste and skill of those ancient races, in finding and utilizing such a



PETRA—ROAD TO THE DEIR



PETRA—ON THE ROAD TO THE DEIR

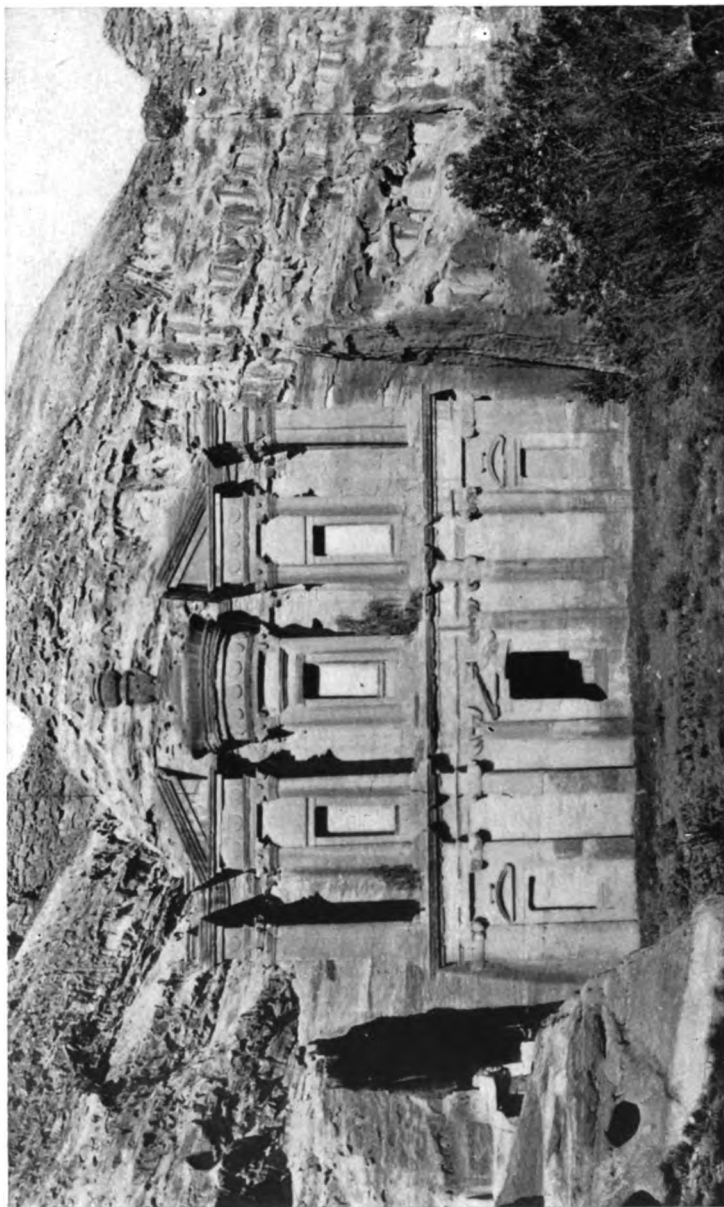
grand spot. It is true that the effects of brilliant coloring fade, as one climbs higher by this path, but when once the mountain-top is gained, other charms comes into play: the crystalline atmosphere, the ragged, fantastic bits of the wildest forms of nature, and then the extensive views, first of the whole Petra mass, then of the plateau from which we first saw the region; and, lastly, of the chasms and abysses toward Mount Hor, leading down to the Arabah, which sometimes stretch away southward toward the Gulf of Akabah.

Opposite the Deir once stood a peak about a hundred feet high, and in its face, toward the plaza, stood a most elaborate temple. The bases of columns still mark the portico in front; and behind them are the remains of the great inner rooms, which extended back into the solid rock. It was a massive structure, larger than the Deir itself. Above this temple, on the top of the peak, are the ruins of what was once a large tower. From this exalted spot the views are superb in every direction, except where one mountain mass cuts off the region of the Dead Sea.

There is not a rock or a cliff within a thousand feet of this plaza which does not show the traces of human handiwork. Doors and windows abound, indicating the existence of rooms behind them, and stairways in all stages of ruin run up and down in every direction. A number of rocks have been cut into huge cubes, and their upper surfaces lead one to think that they were once surmounted by the

familiar pyramidal masses. Other detached rocks are encircled with stairways, making one suspect the existence of small "high places." We climbed several and found cuttings that suggested pools and even altars, but the lack of time and the want of ropes and ladders made a careful examination impossible. We carried away the impression that somewhere in this region will be found another high place to match, perhaps to surpass, that in the city itself! The one isolated rock, which seemed to exhibit the closest resemblance to the remains of platform, pool, altar, and drainage, looks down the magnificent gorge into the city, in just the same manner as the other High Place commands a view of the city. It is also probable that the higher masses behind the Deir may yield up some new treasures for the Biblical archæologist. We thought we could see the decayed bases of two pillars, with traces of carving about them, but were not able to climb up to them.

As we reviewed the whole conception of that rocky stairway, mounting seven hundred feet from the brook, penetrating into the heart of the mountain, following the windings of the fantastic gorge, crossing every stratum of the many-hued sandstone; the steps, now yellow, now red, now banded, now white, now waving like a banner in the wind; the sides of the roadway adorned with seats and pools, and tablets and shrines; the smaller fissures filled with stairways leading into nooks unseen and unsuspected; the deep cuttings undertaken wherever



PETRA—THE DEIR

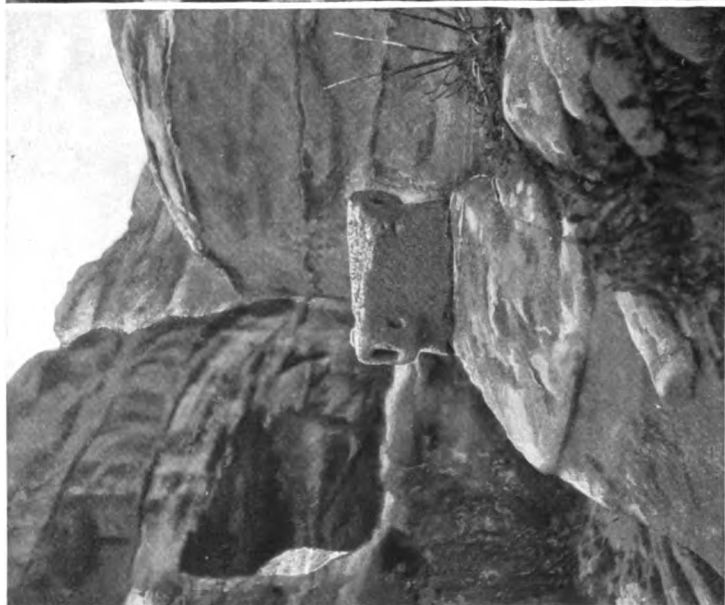
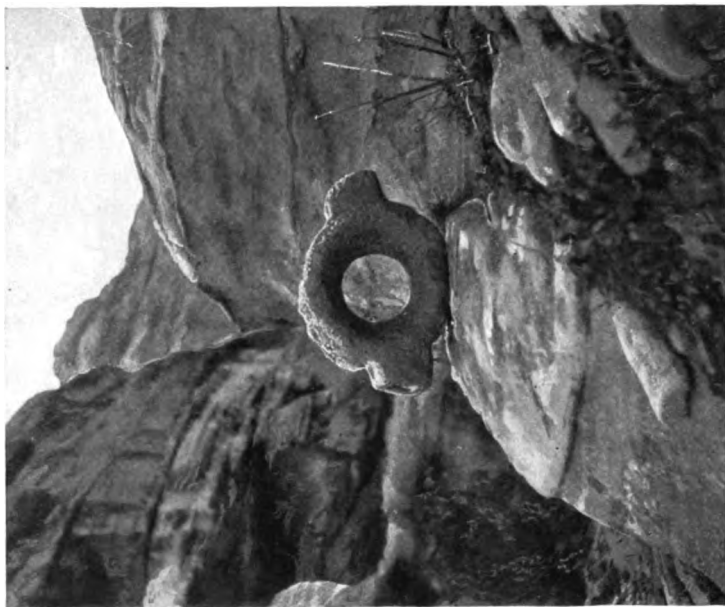
the precipice left a space for a human foot ; then this plaza surrounded by the wildest beauties of nature and the most wonderful structures ; the views down the gorge into the city, over the whole Petra mass, over the chasms to Mount Hor and Aaron's tomb, and down the Arabah—it seemed to us that the combination is certainly one that no other city on earth can easily equal. And again and again we were forced to recognize the superior genius of the spirits and men who saw the possibilities of the situation, and added to nature the charms of art.

While we were wrapt in the contemplation of the beauties of the scene, an episode occurred that appealed to another side of our nature, the very memory of which causes one's heart to sink. We had been informed of the existence of the ibex in these mountain fastnesses, but somehow the guide Musa did not make the matter impressive enough. So, thinking only of the existence of blue rock pigeons and partridges, we made the sad mistake of carrying only a shotgun and the camera, leaving both Winchester rifles at the tents. While one of us was on the peak admiring the views and the other was manipulating the camera, we were disturbed and amazed by seeing *seven* ibex come out of a gorge, run across the greensward, and disappear into a narrow ravine ! The man on the peak came down at a pace that endangered his life and limbs, and made breathlessly for the opening of the ravine, expecting to find the seven graceful creatures caught as in a trap. But what was our con-

sternation, our dismay, and our despair to see those seven ibex go cantering up the apparently impossible rocks, not more than a hundred yards away, at the speed of an express train ! One bullet dropped hastily into the choke-bore was sent flying in vain at the receding figures. With our rifles we could have fired half a dozen shots before they disappeared. None but a real hunter will ever know the emotions of our hearts, and the impression made of what might have been ! Some uncomplimentary remarks were flung out concerning the whole art of photography, as our *first* chance to shoot an ibex, and perhaps our *last*, slipped away forever.

On our way down we failed to enjoy the beauties of the fading sunlight in the gorge, because those seven ibex kept running across the seat of memory in our brains. The blue rock pigeons seemed to mock us, and the partridges clucked more defiantly than ever. We paused long enough to discover and photograph an ancient Roman hand-mill, cut from a block of basalt. It lacks the cone of basalt upon which it fitted and revolved, but shows plainly the sockets into which its handles fitted.

We went to rest early that evening, but all night long those *seven ibex* kept galloping over the rocks, and we, in our dreams, were hunting in vain for the rifles !



PETRA--ROMAN HAND-MILL

CHAPTER X

MOUNT HOR

THE region of Petra, and more especially of Mount Hor, is "paved with the good intentions" of travellers unfulfilled. Burckhardt (1811) struggled hard to ascend Mount Hor, but was obliged to halt on the little plain half-way up, without reaching the top. Neither Laborde (1827), nor Robinson (1838), was allowed to make the attempt. Many other parties since their day have seen the white tomb on its summit from afar, and sadly against their will turned away from it forever. But since the roads have been better known, and travellers have been able to dispense with native guides, the ascent has been made by a number who have left some records of their experiences.

The difficulties are not physical, but arise from the jealousy, the cupidity, and the superstitions of the people, who claim the shrine and guard its approaches. The Bedawin who roam over the land of Edom have been described by travellers as the worst of their race. Pococke speaks of the Arabs about Akabah and the Arabah as bad people. He

calls them notorious robbers, who are always at war with all others. Joliffe alludes to the district as one of the wildest divisions of Arabia. Burckhardt says that in this region he felt fear for the first and only time during his travels in the desert, and that this route was the most dangerous he ever travelled. He had nothing with him that ought to have attracted the notice of the Bedawin, or have excited their cupidity, and yet they even stripped him of some rags that covered his wounded ankles. Leigh and Banks, and Irby and Mangles (1818), were told that the Arabs of Wady Musa were a most savage and treacherous race, murdering pilgrims from Barbary, and acting toward all comers as the Edomites did toward the Israelites, when they refused them passage through this country on the way to the Promised Land. It is a mystery why this ancient, world-old churlishness should appear in the modern dwellers, but so it is. They seem to have drawn it from the soil or to have absorbed it from the fountains. But whatever its explanation, here it is, three thousand years and more since Moses was rebuffed.

Aaron's tomb on Hor is now a Moslem shrine. Like Moses' tomb below Nebo it has been coveted and fought for by Christians, and more especially by Jews, whose reverence for both these Israelite heroes is well known to the Moslems. It will be woe to the poor Jew, for many years to come, who is found within twenty-five miles of that sacred spot on Hor!



PETRA—SOUTHERN VALLEY, ROAD TO MOUNT HOR

Another element entering into the situation is the deeply rooted superstition connected with the tomb, according to which the people firmly believe that evil will surely befall, before the year is out, the wretched man who commits the sacrilege of aiding or guiding any stranger to the sacred spot at the top of the mount. It is true that their cupidity now and then overcomes their fears, but the deep-rooted superstition and the dread of evil raise the price demanded. As late as 1883 the party made up of Kitchener, Armstrong, and Hull, paid £34 (\$170.00) for the privilege of one day to visit Mount Hor, and afterwards passing through Petra. Ordinarily the amount of bakhshish depends upon the number of men who get wind of the strangers' coming, and who reach the spot in time to claim a share. It is then "many men, many money." When their superstitions and cupidity have not availed, they have often thwarted parties by threatening to plunder their camp or caravans while the owners were climbing the mountain, and a party strong enough to hold its own while united, dared not sub-divide itself and become an easy prey to the unscrupulous people.

Even at the present time they will not act as guides up Mount Hor, no matter how willing they are to serve a camp in Petra. Our man Musa begged off from having anything to do with our going up Mount Hor. He afterwards compromised with his conscience, and promised to meet us on the top if we ever reached there. He kept

his promise and appeared on the summit, but we never learned how he placated the "Neby" or the villagers, who would have killed him had they seen him.

Travellers who wish to visit Aaron's tomb must allow at least six hours for the trip if they wish to return to Petra. We were two hours on horse-back from camp to the base of the peak. The latter part of the ascent must be made on foot. We rode from camp to within fifteen minutes of the summit, and in the course of our journey proved conclusively the existence of a *second* road leading out of the Petra valley. Our route led up the southern slope from the brook, past a solitary column standing on the watershed, and down into the small ravines which drain into the gorge behind the Citadel Rock. Then passing up a dry torrent-bed, lying parallel to and not far from the great western wall, we moved southward, ascending all the time, until we came to the southeastern corner of the Petra valley. The bed of the ravine gave place to a broad road, which wound beautifully among the humps of colored sandstone until it began to mount rapidly in great curves to a break in the ramparts, through which it passed easily into the open country or plateau beyond. The photograph marked "Road to Mount Hor" gives a backward view of the road from a point near the exit and much higher up. The nearer we came to the exit the greater the amount of excavation, but the rock here being of the softer white



MOUNT HOR

strata these excavations have almost melted into complete ruin. We noticed the existence of huge cube-shaped blocks guarding the entrance from this quarter, just as we found them at the entrance of the Sik. At the extreme outer face of the sunken rampart are two massive pedestals, measuring ten by eighteen feet.

The road leading out of Petra at this point is called the Gaza road, because after two hours it swings round south of Mount Hor, climbs the low ridge, and drops into a ravine which leads to the Arabah, from which it finds its way across Southern Judea to the seacoast at Gaza. This road was once a Roman road, as is plainly seen at a score of points. It crosses the plateau in sight of the deep exit gorge of the Wady Musa brook, and then strikes into a winding valley that ascends gently to the south, almost parallel with the mass of Mount Hor. After three quarters of an hour's ride from the two pedestals marking the exit from Petra, a smaller road leaves the main one at right angles and begins to climb the steep slope towards Aaron's tomb, which is visible at many points along the main road after it emerges from the Petra valley. A stiff climb of nearly an hour, over a very rough bit of road which winds back and forward round the base of the peak, brought us to the saddle between the two highest masses, and we dismounted at some lizari trees, which grow in a notch of the peak.

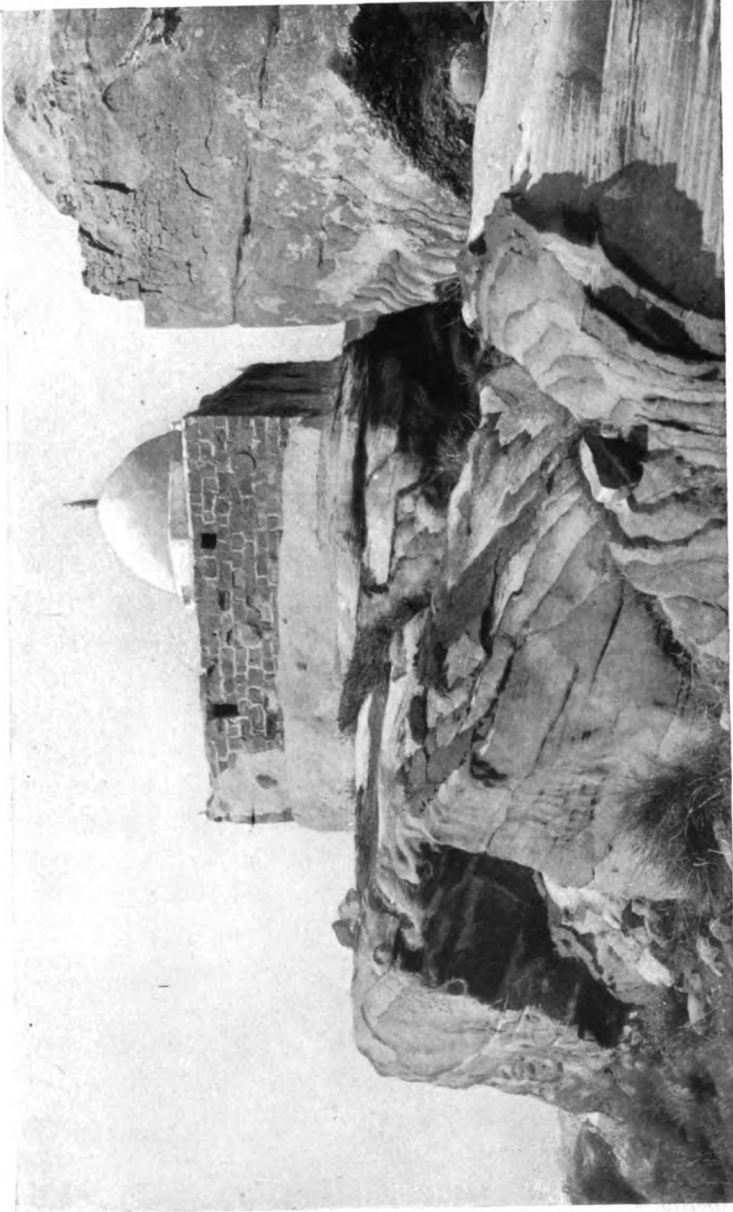
Just here is a wide, sloping space, where thousands

of men and animals can and do camp in the open air, at the annual feast and pilgrimage to the shrine. We saw only one human being by the way, and we went well armed but unattended by any one, except Mustapha the Kurd, who was in ill-humor all day, but obliged to go along and care for the three horses.

We carried luncheon and a supply of water, for Musa had assured us that no water existed outside of the valley. We found later that even Musa could lie, for in the same notch, a hundred feet higher up, was an excellent cistern in which was water in abundance, but unobtainable except by the use of a fifty-foot rope and some vessel to draw it with. Musa joined us before luncheon, but seemed to be in mortal dread lest some inhabitant of the region should see and recognize him.

The last two hundred feet of the climb is up the steep rock by means of long stairways, steeper than any ladder, and positively dangerous at places. There are many traces of other stairways, which have been hewn in the rock, used for centuries, worn out, and abandoned. We left Mustapha to guard the animals, and had Musa with us for the final climb, which was a stiff one of fully fifteen minutes.

Travellers coming from the south speak of Mount Hor as the highest mountain in sight along the route. Its mass of reddish sandstone and conglomerate "rises in a precipitous wall of natural masonry, tier above tier, with its face to the west.



MOUNT HOR—AARON'S TOMB

The base of the cliff of sandstone rests upon a solid ridge of granite and porphyry, and the summit of the sandstone is somewhat in the form of a rude pyramid." "No more grand monument could be erected to the memory of a man honored of God, than that which nature has here reared up. For amidst this region of natural pyramids, Jebel Haroun towers supreme. . . . Jehovah in passing sentence of premature death upon His servant, for a public act of disobedience, left him not to die without honor, and forever after the most conspicuous peak in all this country has been inseparably connected with his name and stands as a monument to his memory."¹

Mount Hor, called by the Arabs "Jebel Haroun," or Aaron's Mount, is one of the few spots connected with the wanderings of the Israelites which admits of no reasonable doubt. Dr. H. C. Trumbull has suggested Jebel Madirah, an isolated hill near Ain Kadis, as the real scene of Aaron's death.² Travellers who have visited both locations have

¹ Hull (1883).

² The twentieth chapter of Numbers, 23-29, gives the account of Aaron's death.

23. And the Lord spake unto Moses and Aaron in mount Hor, by the coast of the land of Edom, saying,

24. Aaron shall be gathered unto his people; for he shall not enter into the land which I have given unto the Children of Israel, because ye rebelled against my word at the water of Meribah.

25. Take Aaron and Eleazar his son, and bring them up unto mount Hor;

26. And strip Aaron of his garments, and put them upon Eleazar his son: and Aaron shall be gathered unto his people, and shall die there.

27. And Moses did as the Lord commanded: and they went up into mount Hor in the sight of all the congregation.

28. And Moses stripped Aaron of his garments, and put them upon

little hesitation in affirming that this peak in Edom more perfectly fulfils all the requirements of the Bible narrative.

"It may also be presumed that as Moses was permitted to view the land of Canaan from Mount Nebo, Aaron was permitted to do the same from Mount Hor. The summit of Mount Hor affords a commanding prospect of the great valley of the Arabah, and the borders of Seir, of the depression of the Ghor itself, and the table-land of Southern Palestine; and we may well suppose the eyes of the high priest of Israel were allowed to rest upon the hills of Judea ere he resigned his priestly robes and prepared himself for his resting-place, perhaps in the little cave which is covered by a Mohammedan shrine, whose white walls are visible to the traveller for many miles around."¹

Stephens noticed an aperture in the floor of the shrine, and, descending, found a narrow chamber, at the end of which was an iron grating and behind it a tomb cut in the native rock. No writer makes special mention of it since. Sir Charles Wilson in 1898 made a careful examination of the interior, but makes no reference to any subterranean apartment. It has been repaired many times within the

Eleazar his son; and Aaron died there in the top of the mount: and Moses and Eleazar came down from the mount.

29. And when all the congregation saw that Aaron was dead, they mourned for Aaron thirty days, even all the house of Israel.

It is to be noted here that the Bible says expressly that "Aaron died there on the top of the mount."

¹ Hull (1883).



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VIEW FROM MOUNT HOR—LOOKING NORTH

century, and it may be that the present guardians have sealed the lower tomb up by extending the new pavement over the aperture. Sir Charles Wilson says : " The present structure has evidently taken the place of a Byzantine shrine, for we found one stone with a cross upon it, and another with a mutilated Greek inscription." We noticed quite extensive ruins on the west face of the southern horn of the peak, some five hundred yards away, but did not visit them.¹ The Christian name preserved in the Deir, just across the ravine, and the existence of crosses and Greek inscriptions here on Mount Hor, together form a beginning of the evidence which may some day substantiate the early Christian occupation of all the region, and add their testimony to the identification of these Old Testament sites.

The tomb as we found it is shown in the photograph, p. 241. It had been repaired, replastered, and whitewashed within a few months. The door was firmly closed and locked, so we made no attempt to examine the interior. We were fortunate in having a perfect winter day for our ascent, and having climbed to the flat roof of the tomb we enjoyed the splendid view. East and south were the ruddy tops of the mountains of Edom. Some have compared the desolation of the scene with the wildness of the region about Sinai. It is true that they are bare and naked of trees and verdure, but the

¹ They may be the ruins of the Crusader monastery mentioned as existing here as late as 1217.

fantastic shapes into which they are weathered and the subdued glow of their coloring go far toward redeeming them from utter desolation. Westward we looked over a still more desolate extent of twisted strata, impassable gorges, bottomless ravines, to the plain and desert of the Arabah, which was visible for fully fifty miles of its extent, while beyond it were the lower masses of Southern Judea.

Toward the northwest lay the southern end of the Dead Sea; and the Lisan, which extends far out into its waters from the base of the mountains of Moab, was plainly visible. The view north, (see photograph, p. 245) gives an excellent idea of the rocky wall which shuts in the Petra valley. On top of this mass, across the chasm lying between, we could plainly see the Deir, white and clean against the darker mass behind and around it. Nearer views of some of the peaks reveal a rugged grandeur that is indescribable.

It is true that in this wide landscape there is a "scarcity of marked features," compared with some other views in Syria and the Holy Land, but it also remains true that the outlook from Mount Hor is one of the grandest conceivable over a waste of mountain solitude and the chasm of the Dead Sea. Our barometers registered forty-six hundred feet¹; adding to this the twelve hundred and ninety feet, we have a depth of fifty-eight hundred and

¹ The height given by Kitchener in 1883 is 4580 as determined by triangulation.



VIEW FROM MOUNT HOR—LOOKING EAST
Showing Relation of Sandstone Mass to Limestone Cliffs

ninety feet to the shores of the Salt Sea. And between its steel-blue waters and the ruddy peaks around Mount Hor lies one of the grandest sweeps of nature's wildest handiwork that can fall beneath the eye of man. Lord Kitchener describes it as follows: "The scenery is exceptionally fine, and I do not consider former writers have exaggerated the grand appearance of Mount Hor; the brilliant colors of the rocks have been remarked by all travellers, but surpassed what I expected to find."

The bird's-eye view obtained from the top of Mount Hor threw a flood of light upon some structural problems which had been taking shape in our minds from the time we left Baniyas up to this moment. They were not much advanced beyond the stage of a theory until we crossed the Arabah on our return journey, when we obtained so much additional evidence upon the subject which supported the theory that it is given at this point, because it was on Mount Hor that the theory really emerged in our minds. That it is at variance with the theories usually advanced for the formation of the valley has nothing to do with the case. If the evidence brought forward in its support is not sufficient it will nevertheless have served the purpose of calling attention to some factors in the problem heretofore overlooked.

In order to have the subject clearly in mind, it may be well to state the problem as follows:

Every one, it is believed, is agreed, that the Jordan Valley is a great rift, approximately parallel

with the border of the Mediterranean, and forming a portion of the great system of fractures in the earth's crust, which separated Europe and Asia from Africa. That this rift occupied a nearly straight line from the end of the Lebanon group of mountains to the Gulf of Akabah, is also undoubted, since the structural evidence for it is complete, and needs no repetition here.

That this rift valley contained a river, or rather a system of rivers which drained the eastern and western plateaus bordering it, through the rift as a main artery, is not a difficult proposition to accept. Why the open connection with the sea should have been interrupted, is a more difficult thing to explain, because it involves more than half of the whole length of the rift.

The first physical feature of the valley which attracted our attention was the steady increase in the altitudes along the eastern plateau. This has already been referred to, and is clearly seen in the diagram, Vol. I., p. 34, showing the variations of our camps above sea-level. If we make due allowance for the horizontal distances involved between the camps, which are necessarily neglected in such a diagram, the gradual character of this rise in elevation is at once seen. The natural inference to be drawn from such a condition of things, where the strata were originally horizontal, is that a general cause operated throughout the whole region, and that the force which produced the effect operated with greatest intensity at the south.



VIEW FROM MOUNT HOR, LOOKING SOUTHWEST OVER THE ARABIAH



The next feature of importance noted was the character of the sedimentary rocks in Petra. It was evident that this deposit took place in shallow and brackish water. A study of the peculiar banded lines in a number of the pictures herewith presented will be convincing evidence of this fact. If we take as examples the bands in the lower part of the picture of Aaron's tomb, p. 241, and those on the left-hand side of the picture of the balustrade, along the pathway, leading to the second High Place, p. 195, we have illustrations, drawn from two points in the series of rocks, differing in position from one another by about thirteen hundred feet vertically. They both display the well-known features of brackish-water formations, and when we add that we observed these characteristics throughout the whole of the intervening series the only explanation which can be given is, that at least this series of rocks was formed while the whole mass was undergoing an exceedingly slow positive movement, that is, a movement toward the centre of the earth, and the water covering this surface must have been shallow and brackish. The problem immediately presents itself as to the thickness of these deposits and their extent up the valley, which might be regarded, at the time when this was going on, as an arm of the sea.

In Petra, the highest points at which we observed the sandstones varied in elevation from forty-six to forty-eight hundred feet above the sea-level, and they were upon the borders of the eastern plateau.

From the top of Mount Hor we made out with our telescopes and levels that other points of contact existed somewhat higher than these, but this can be taken as the upper limit of these rocks. That they were nonconformable with the limestone plateau was clearly seen as we passed down its slopes to Elji, as the limestone strata maintained their horizontal position between the masses of sandstone, which looked at a little distance as though they had been plastered against the wall of the plateau. The difference in elevation above sea-level between the top of the sandstone and the surface of the plateau is between fifteen hundred and two thousand feet at Petra. Mount Hor can therefore be considered as a gigantic remnant which has resisted the elements better than the rest of the mass on account of the tougher character of most of its components or the bond which united them.

The ragged contact line of sandstone and limestone is plainly seen in all places where the eastern plateau is included in any photograph, see pp. 211 and 249. This is true of those taken from Mount Hor, also in the view of the Petra valley proper from the High Place, which gives the relations of the walls of the valley and the face of the plateau very clearly.

From the top of Mount Hor another feature was very plainly seen, which was that the sandstone mass of which the mountain is a part was located in a bay or indentation of the rift. We were able to decide this point, but could not determine the



VIEW FROM MOUNT HOR—LOOKING WEST

dimensions of the bay for the lack of the time necessary to visit the portions of the limestone plateau in question.

The theory of the formation of the valley and the explanation of the existing phenomena, dependent upon it, which suggested itself was as follows :

After the formation of the rift, a period of rapid sedimentation set in, during which time the southern portion of the region was submerged slowly until the time arrived when the sea had reached as far up the channel as a point a few miles south of the Sea of Galilee. This point is chosen, not only because our measurements and the proportions derived from them would fix it there, but also because the remnants of these sedimentary rocks have been reported from that portion of the valley, and are to be traced southward from it, but not northward. This we have not determined for ourselves. They are certainly, however, to be found above the northern end of the Dead Sea, on both sides of the valley, where they can be traced at intervals for miles on account of their distinctive colors, so strongly in contrast with the limestone.

After this period the motion was slowly reversed. Not quickly enough to prevent surface erosion over nearly its whole extent, but effectually protecting such bays in its sides as the one in which Petra is located. In these bays the whole process of denudation has probably been accomplished by atmospheric causes, including the rain. This process

continued until the uppermost strata had been lifted at least three thousand or thirty-five hundred feet in the region of Petra. Now a change took place in the procedure : either the motion gained in rapidity or the erosive power was weakened, and the surface of the rock rose above the water, thus cutting off the connection with the sea. The negative motion away from the centre of the earth, however, did not apparently cease until a further elevation of at least a thousand feet had taken place. By this means an extensive sandstone plug was left in the rift between the southern end of the Dead Sea and the Gulf of Akabah. Erosion upon the surface of this mass has since then progressed from both ends until we have two systems of streams in the valley of the Arabah, one set working their way northward to the Dead Sea, and the other set, the shorter of the two, southward to the Gulf of Akabah, the watershed being about eight hundred feet above sea-level. This latter point was visible from Mount Hor, as the remarkably clear day aided us in the use of our telescope to good advantage.

We spent fully three hours on the summit, and were loath to leave the matchless spot. We collected many bits of marble and mosaic, and cut a bunch of canes as mementos of our visit. Our journey to camp was uneventful, and we found all well among our caravan.

Just before sunset we took a farewell stroll among the ruins of the city along the brook. We reviewed the general features of the rocky rampart, and we

watched the changes of color that crept over the valley under the rays of the setting sun. As far as we knew we were the sole occupants of all this grandeur and desolation. We fain would have prolonged our stay in the region, but the return journey was still to be accomplished, and our friends and duties were calling for our return. We kept watch with the stars until long after the camp was silent, and then said a last good-night to the enchanting beauties of the valley.

CHAPTER XI

PETRA TO THE DEAD SEA

OUR journey back to Jerusalem occupied nine days travelling, about sixty hours¹ in all as our caravan moved: three days to Tafleh, two days down to the Dead Sea, one day across the Arabah, and three days on to Jerusalem. We give some details of the road in the hope that they may prove of value to others following our route.

March 6th dawned clear and cool. We broke camp and were on the march at 8.15. Crossing the brook, Musa led us north and then northeast until we came to the northeast corner of the valley. The eastern wall and northern boundary closed in until nothing was left but the winding bed of a narrowing valley called the *Faj*. It resembled very much the opening toward the southwest. Much of the roadway was the solid rock, but the gritty sandstone never fails to furnish a foothold. At several points there were high steps and ugly little fissures, but with a little assistance all our loaded mules got

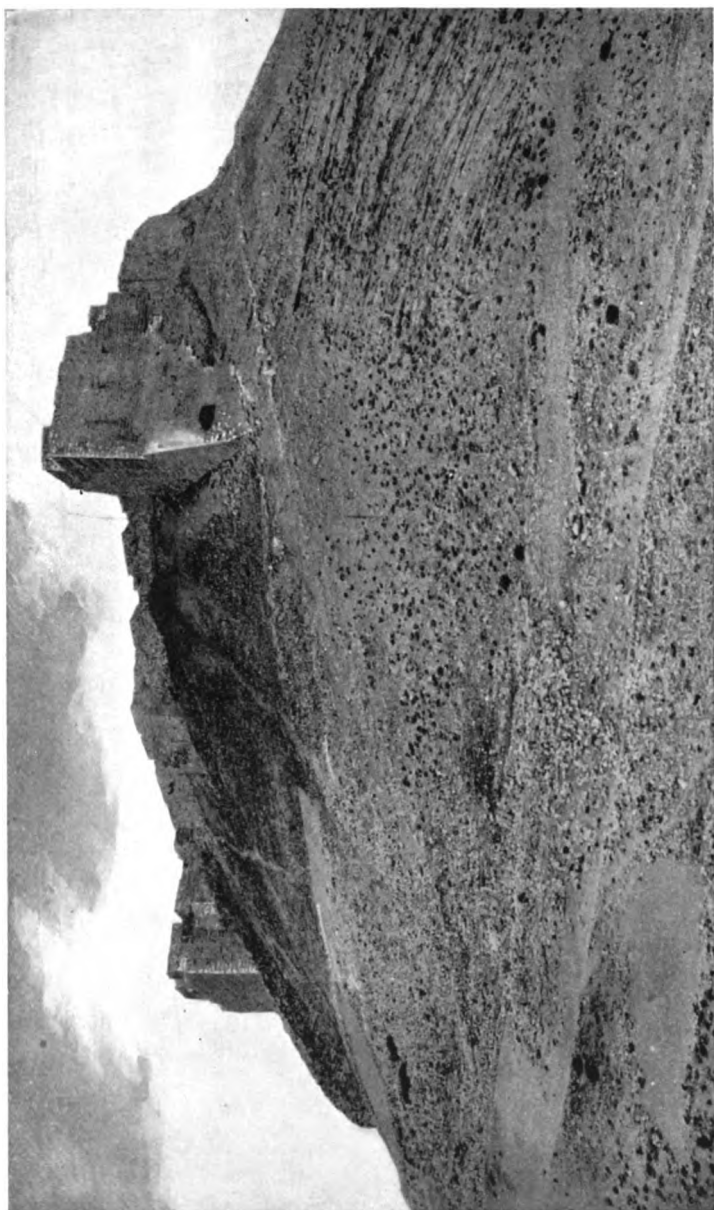
¹ To Shobek seven hours; to Buseirah six; to Tafleh four; to el Abrash eight; to Ghor-Unsur five; to Zaweirah the Lower eight; to Bir Im Hashim eight; to Hebron seven; and to Jerusalem seven—making sixty hours.

safely past them. After an hour the Faj became so rough and narrow that the road led up the rocks to the right, crossed over a side valley called Um Seihun, and after five minutes' progress in this direction came back into the Faj. By 9.30 we were completely clear of the Petra rampart, and thus proved the existence of a *third* road leading out of the valley. It was very evident also that this road, if not opened, had been greatly improved by the Romans, and as we found later was the continuation of the second Roman road from Shobek.

An hour and a quarter after leaving camp we were opposite to a mass of rocks on the left, a hundred and fifty feet high which showed stairways cut in the face of the walls, and excavations at several levels. A road bore off to the left leading to an Arab encampment. We kept to the right for another ten minutes, until we met a road at right angles to ours. Here we turned sharply to the right, and began to ascend the slope toward the east, and in forty-five minutes reached a fountain called Ain Im Arara. In fifteen minutes more we were beside the ruins and fountain of Dibdiba. During the two and a quarter hours we had climbed from the camp at three thousand feet to forty-six hundred and fifty feet at this fountain. Then we pushed steeply up the mountain above the fountain, and in fifty minutes were on the plateau. Below Dibdiba we had not followed the line of the old Roman road, but above the ruins we traced it plainly on the slope, and found it also on the ridge

of the plateau, where the barometer registered fifty-seven hundred and fifty feet.

The sandstone ended at forty-seven hundred feet, just above the fountain, and the limestone cliff began. Almost at the edge of the plateau we struck into a little valley leading after twenty-five minutes' ride to an Arab encampment above Ain el Arja. Avoiding the fountain below us on the right, we again ascended along the line of the Roman road to a low ridge (5720 feet) and entered the head of Wady Nijel, with its green slopes and fine oak trees, which we followed all the way to Shobek, with one or two deviations over shoulders which shortened our road. At 12.30 we lunched under the beautiful oaks, at the point where the narrow valley opens out and the oak trees end. The Roman road is plainly visible all along this path. About an hour beyond this point we swung away from the lowest line of the valley's course, and ascended the plateau to the right where our barometers registered fifty-one hundred and fifty feet. Sighting some ruins ahead of us, and some sheepfolds at the base of a hill, we made straight for them, and in forty-five minutes were at their base, and in the Wady Nijel again. Twenty minutes later, we were at the fine fountain of Ain Nijel (4900 feet), whose waters flow toward Shobek and turn the mills referred to on our route from Shobek to Petra. We reached our former camping-place at four P.M., without fatigue, in exactly the same time that we made going in the other direc-



SHOBOK FROM THE SOUTH

tion. We thus proved conclusively the existence of three openings into the Petra valley, and the existence of two Roman roads, paved with basalt, between Petra and Shobek.

Between Shobek and Tafiieh, we again broke the ten hours' journey into two stages. In leaving Shobek we did not descend into the valley road, but climbed the eastern slope to the plateau, taking the road to the right at the olive grove, and reaching the plateau in twenty minutes (4600 feet). We made a wide swing out eastward, following the line of the Roman road, which cleared all the heads of the ravines leading down into the deep valley below Shobek. One hour and twenty-five minutes after leaving camp, we met our old friends, the telegraph poles and wires, coming from Maan and Mecca, and then went on for an hour to Khirbet Somra. Twenty-five minutes later we left the plain and entered a valley lined with lava blocks, sloping from north to south. After half an hour we were among ploughed fields, and at twelve o'clock, three and three quarters hours from camp, we stopped for luncheon at a well called Bir Shehathi. Ascending easily for half an hour beyond this well, we reached the highest shoulder of the range, and from an elevation of fifty-five hundred and fifty feet enjoyed another magnificent view of the Arabah and the country beyond. Passing our old camping-place at Ain el Gelaidat, we descended for over an hour to the beautiful stream of water just above Buseirah, where we pitched for the night (4200 feet).

A four hours' journey along the well-beaten road next day brought us to our former camping-ground at Tafleh, and gave us abundant time to make all preparations for spending the Sabbath.

When we called upon the acting governor, in order to secure additional soldiers as guards into the Dead Sea region, we found an inspector from Damascus present, a type of man that no one has any respect for. He attempted to answer for the acting governor, and went on to say that our plan to go to Jerusalem by the south of the Dead Sea was an impossible one, and that we could not have guards for such a purpose, because all the soldiers were away among the Bedawin. We reasoned with him for a time, and when his insolence increased, we told him that guards or no guards we were going that way, having made such an agreement with Rasheed Pasha at Kerak, on the strength of orders from Nazim Pasha from Damascus, and that when we made our complaints to Damascus, he (the inspector) could make all necessary explanations for not having sent soldiers with us. This brought the man to his senses, and we left him to do as he chose. Next morning we heard that he had returned to Kerak, and about ten o'clock the acting governor and all his officials, eight in number, came to call upon us in camp, and were as pleasant as they knew how to be. The Zabit (head of the soldiers) assured us that we should have all needed protection, and we assured him that one extra soldier would be enough. We



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TAFLEH FROM THE SOUTH

announced our intention of leaving at a certain hour and the soldier could start with us then or catch us later.

During the day we heard rumors of a party coming from Egypt, via the desert, and that government horsemen had gone down to meet them and to turn them back. They were said to have seventy camels and eight tents in their outfit, but their camels were afterward reduced to forty, and we heard no more of the party. When it became known in Tafleh that we were going straight for Jerusalem, and were well armed, various people came, asking to be allowed to join our caravan, and finding that some of them knew the route, and the whereabouts of the very uncertain pools of rain-water, we were glad to give them permission to join us and to promise them protection. One of the men proved of great service to us, for not one of our party had ever been over the roads.

In the afternoon we made our way through ruined and narrow streets to the tower seen in the centre of the picture (p. 74), and returned the call of the commander of the Tafleh garrison. He treated us politely, and when coffee was served we noticed a silver filagree button in the bottom of the coffee cup. Inquiring its meaning, we were told that it contained a small piece of amber, and that the people of this region, clinging to an ancient custom and belief, thought that its existence in the cup and washed by the coffee imparted some valuable medicinal influence upon the lungs and throat !

While we were at breakfast on Monday we received a telegram saying that all was well at Beirut, and we surprised the operator by posting a budget of twenty-two letters, more than he had seen in a month. He was pleasant and obliging, as were all the officials in the town with the exception of the visiting inspector, whose departure no one mourned.

At the highest point on the road from Petra to Tafileh our barometers registered fifty-seven hundred and fifty feet, which added to twelve hundred and ninety-two feet, the depression of the Dead Sea below sea-level, makes a total descent of seven thousand and forty-two feet. The whole of the plunge came within the space of twenty hours' muleteer travel,¹ and sixty-four hundred feet of it in less than twelve hours. The road is by all odds the most frightful for loaded animals that we ever took a caravan over. For miles it led over barren rocks, where naught but the foothold on the gritty sandstone saved our loads and animals from instant destruction. There were narrow ledges and narrow ravines where our bulky loads could hardly pass. There were places where the many passers had worn a path so deep and so narrow that as our mules walked in it their loads scraped the ground on each side, and we were forced to spend time in filling such places up with broken rocks. There were steps so high and dangerous that our muleteers despaired of ever getting

¹ Highest point to Tafileh, five ; to el Abrash, eight ; Ghor, five ; to Dead Sea, two.

down them, and made the mountain-side ring with their supplications and imprecations. At many places the road completely disappeared, and each mule picked his own way down the rocky precipice, getting into impossible positions, and more than one of them turned a complete somersault with our loads, but, fortunately, with no serious damage. We know not what other roads may be leading from Edom down into the Arabah, but we are sure that they could not be anything worse than this road down from Tafeleh.

We were away from camp at eight A. M. and for four hours the general direction was northwest. The road is known as the route by el Abrash.¹ From our camp in Tafeleh it looked as though we could drop a rifle-ball into the waters of the Dead Sea, but it took us more than thirteen hours' hard journeying to reach it. The telegraph office in Tafeleh is thirty-six hundred and fifty feet above the sea-level. The road dips down and swings round the northern side of the amphitheatre of mountains, and after fifty minutes rises again to over four thousand feet, above a village called Aineh. Then in thirty-five minutes it drops over five hundred feet to the village itself. Forty-five minutes beyond Aineh the road forks; its upper branch is a second road to Kerak; we took the lower branch, leaving several small fountains of water above us on the right. The Roman road to Kerak evidently followed the upper branch. Our

¹ Points to be inquired for, Aineh, Bir Mlih, el Abrash.
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road dipped down to about thirty-three hundred feet, and after an hour and a half of slight ascents and descents we rose to a shoulder of the mountain (3840 feet) from which we took our last view of Tafleih, nearly four hours behind us, and also looked down into the valley of the Ahsa and the Dead Sea. It was an awe-inspiring view.

The road now swung westward, and from this point plunged downward. In twenty minutes we had dropped to thirty-two hundred feet, and halted for luncheon at a well called Bir Mlih (see photograph), one of the last drinking-places on this frightful road. While we rested here, Milhem followed a large flock of wild pigeons and brought down three at one shot. From this unclean well the road swings round to the southwest, and is easily followed for an hour or more. It goes round many small valleys, but not into them, and presents a series of superb views of the Ahsa valley and Dead Sea. Two hours from the well we had dropped to nineteen hundred and fifty feet, and at this point the limestone formation ended, and we entered the sandstone again. The remaining three thousand feet of the descent the road is simply frightful.

During the next hour we dropped from nineteen hundred and fifty feet to eleven hundred and fifty feet, and reached the nook in the ravine called el Abrash. Here we decided to pitch for the night, it being now four P.M. Palm trees once grew in this region, and gave it the name of en-Nakhaly, but nearly all of them have now died out. We noticed



275 BIR MLIH, ON THE ROAD FROM TAFILEH TO THE GHOR

a few stunted ones among the high rocks about us.

Our first effort was to find water, and in this search the people who joined our caravan served us well. Relieving the animals of their loads, they roamed among the rocky ravines, and after a quarter of an hour they called out: "We have found water! We have found water!" We visited the spot and saw a dirty, foul-looking pool of rain-water, from which foxes, birds, and perhaps other wild animals had drank, and where they had bathed. In color it resembled dirty vinegar, and contained all manner of living creatures, visible and no doubt invisible. But there was nothing else within many miles, and we proceeded to make use of it for all camp purposes. After the first boiling it looked like milk and had a very decided smell. We boiled it again, and while it was a little clearer it was not any more palatable. This camp marked the beginning of our pangs of thirst, which distressed us all the way to Hebron, four days beyond. While pitching our tents, we discovered that the region was infested with scorpions. Every stone, small and large, seemed to have a nest of them beneath it. We warned the men, and cleared the space beneath our tents as well as we could, filling a bottle with fine specimens, and even though many miles away from any human habitation, we did not relax our guard over the tents and animals during the night.

We got away early the next morning, and for

three hours the strain on mules and men was almost unbearable. We thought the road of the previous day bad enough, but this last descent exceeded all in danger. The road from our camping-place climbed a steep mountain face for several hundred feet, and wound in and out among the rocks and ravines in a manner that defies all description. No one should attempt to find it without a good guide. At the end of the first hour, we had dropped about two hundred feet below the level of our camp. In the next hour we dropped over seven hundred and fifty, and our barometers had reached the sea-level. In another hour—three hours from camp—we reached the waters of the Ahsa, issuing from their deep valley, six hundred feet below the level of the Mediterranean. Our caravan was nearly two hours behind us.

At one point in our descent we bagged some partridges, and at another we amused ourselves, while waiting for the caravan, by rolling huge rocks down a thousand-foot slope into a gorge below, waking earthquake echoes and startling all the animal life, large and small.

The views of the Dead Sea region contracted as we descended, until by the waters of the Ahsa we seemed to be in a meadow-like plain which was dotted with patches of dense, thorny bushes, among which grew the apples of Sodom. This wide stretch of arable land, formed and watered by the stream of the Ahsa, is the possession and home of the tribes of Kaabineh Arabs, about as poor and as

miserable-looking mortals as can be found in all Syria. Hashim, our soldier, rode to their tents, three miles away, in order to secure a couple of guides who could lead us safely around the treacherous waters of the Dead Sea. Before he returned our caravan had arrived. The loads were thrown down and the men and beasts washed themselves in the stream and thoroughly quenched their almost unbearable thirst.

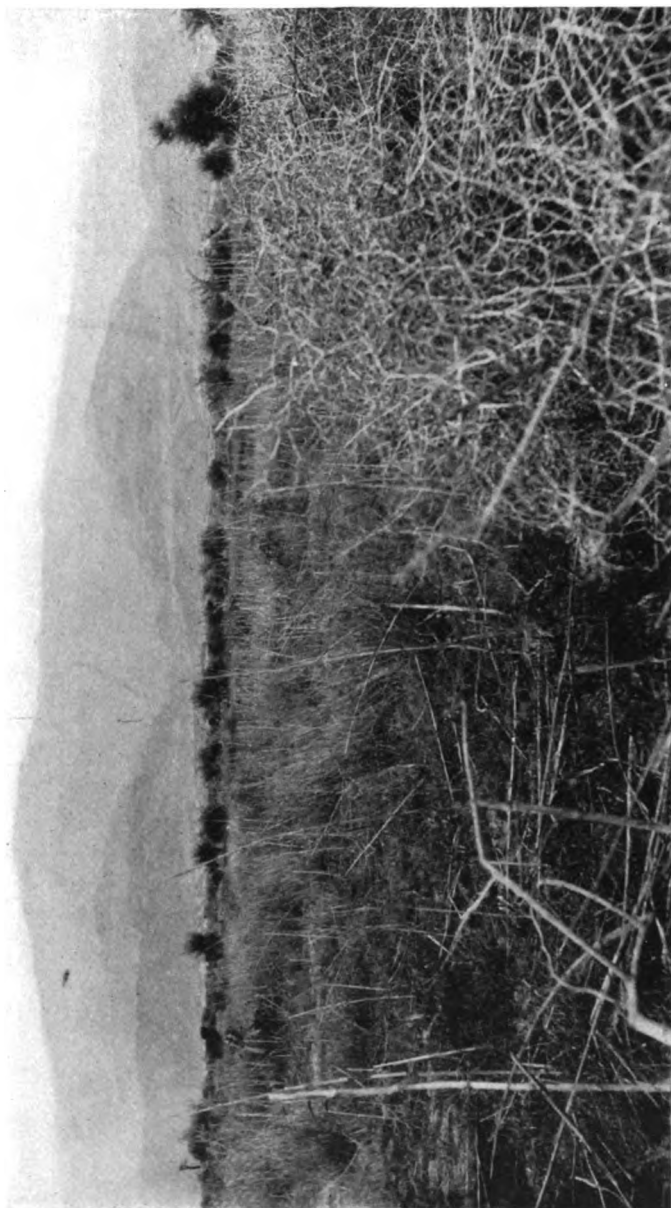
At the entrance to the canyon of the Ahsa, where the river comes out into the Ghor, an interesting delta is found. To all appearances it was formed under water, and then elevated above the water level. The stream flowed out over a flattened, dome-shaped mass of considerable area.

CHAPTER XII

THE DEAD SEA

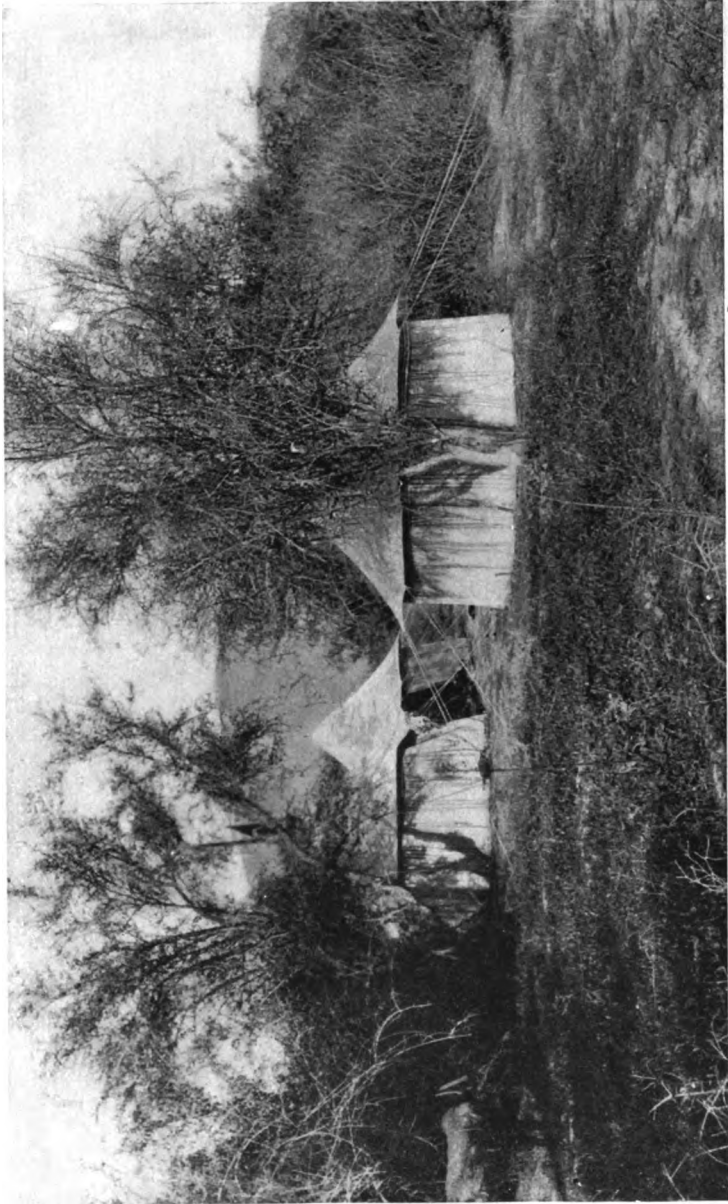
THE names of the region about the Dead Sea are a puzzle to many who have not studied the details of its geography. The cleft or vale between the Dead Sea and the Gulf of Akabah is known as the Arabah. The Jordan Valley between the Sea of Galilee and the Dead Sea is called the Ghor. But these two divisions overlap, and sometimes the Dead Sea is said to be in the Arabah, which in Hebrew usage included the lower Jordan Valley; while at other times the sea is said to occupy the lower end of the Ghor. The word Ghor means the depression or hollow, and hence we have the word applied to parts of the cleft, as Ghor Beisan, Ghor Nablous, and at the southern end of the Dead Sea the Ghor es Safiyeh. The people who live in the Ghor are called Gha-war-neh=Ghorites; but many of the Ghawarneh winter in the Jordan Valley and summer in the highlands, as do those who claim land about Banias; while others are too poor to own a second camping-ground, and dwell forever in the hot valley.

As we had decided to push on into the Arabah



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TAFILEH PLATEAU FROM THE GHOR



CAMP IN THE GHOR

so as to shorten the journey next day, the men replaced the loads and, guided by the two Arabs, we left the park-like region of the stream and turned due south, along the edge of the barren slopes. We noticed that the great irrigated patch of arable land at the mouth of the Ahsa was practically surrounded and isolated from the barren hills and the wastes of sand and mud by a jungle of zizyphus and thorny bushes that presented an almost impassable barrier. Where the natural growth was thin or disappeared, we saw miles of rude hedges made from the thorny branches cut from the trees and rolled into a compact barrier. There must be fifteen or twenty square miles of this watered arable land, and between the natural hedges, the artificial ones, the watercourses, and the unspeakable mud-holes, the region is almost impassable to any one except a dweller in it, who can find his way by the paths known only to these people.

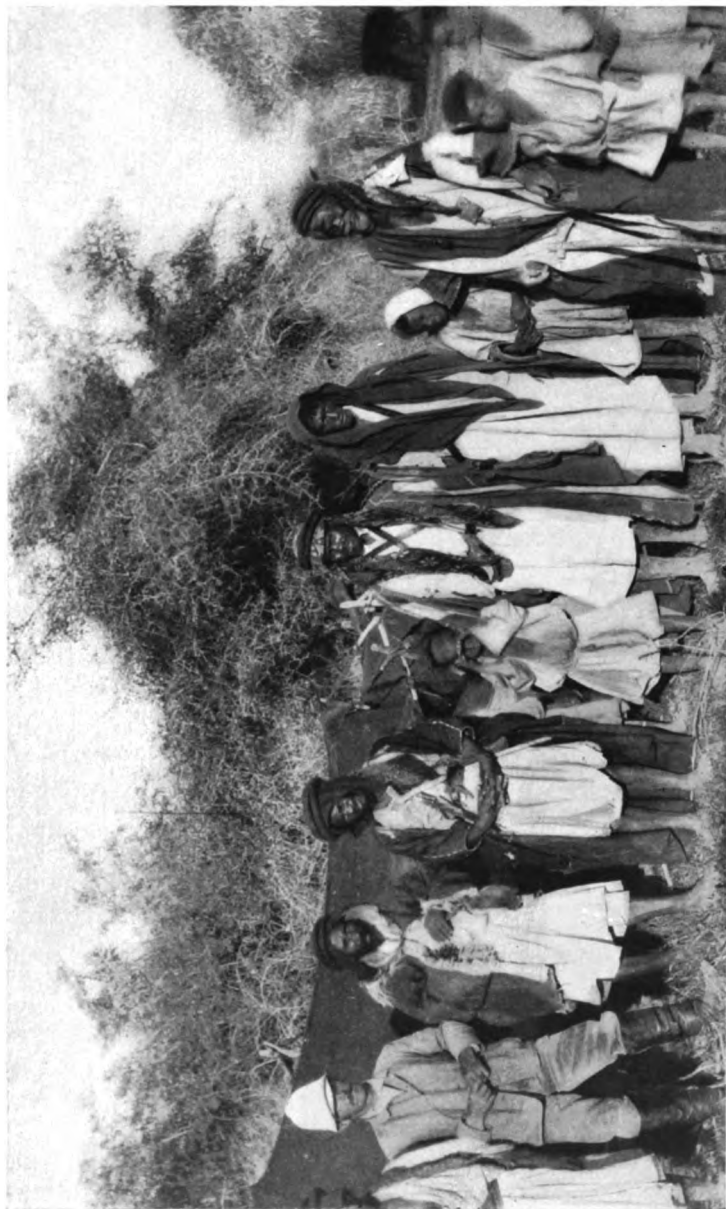
After passing many ruins, built mainly from the sun-dried brick, we followed our guides through a break in the jungle and over fields of wheat, over watercourses, through mud and briers, until we came to a still denser growth of larger trees and bushes. Here we were forced to proceed in single file, and after a little time found ourselves among the tents of the Ghawarneh, set here and there among the dense bushes in little circles or squares of four or five tents each, and each circle the home of a howling mass of men, women, children, sheep,

dogs, goats, and poultry. One narrow path led into the circle, and another narrow path led out of it, hence the passage of our caravan caused a frightful commotion for miles. We had to keep a sharp watch on the laden animals. If they had disappeared suddenly, perhaps they might have been recovered half an hour later, stripped of everything but their hides. Having threaded this labyrinth, we emerged into the clearer country beyond, and there pitched our tents among the trees and bushes, at a place called Unsur. Our first care was to see all our belongings safely stowed in the tents, then we looked after the provision of milk and water. The stream, where it issued from the valley of the Ahsa, was clear and drinkable, but after traversing the plain in a ditch and supplying the "circles" of tents and their motley collections of animal life, it was almost as foul as the water of the pools at the el Abrash camp. Again we boiled it, and again we felt the pangs of thirst which we had no means of assuaging. Coffee and tea do lubricate and sustain the system, but nothing quenches thirst as surely and as completely as clear, pure water. The fact that we could not obtain any at any price, and that we had two dry days ahead of us, did not diminish the desire for it.

We visited the wretched tents of these Kaabineh Arabs. They are formed of dark cloth of camel's hair, resting on low poles and rafters, and the lack of ropes and other accessories make them the meanest



GHOR—NATIVE HOUSE-TENT



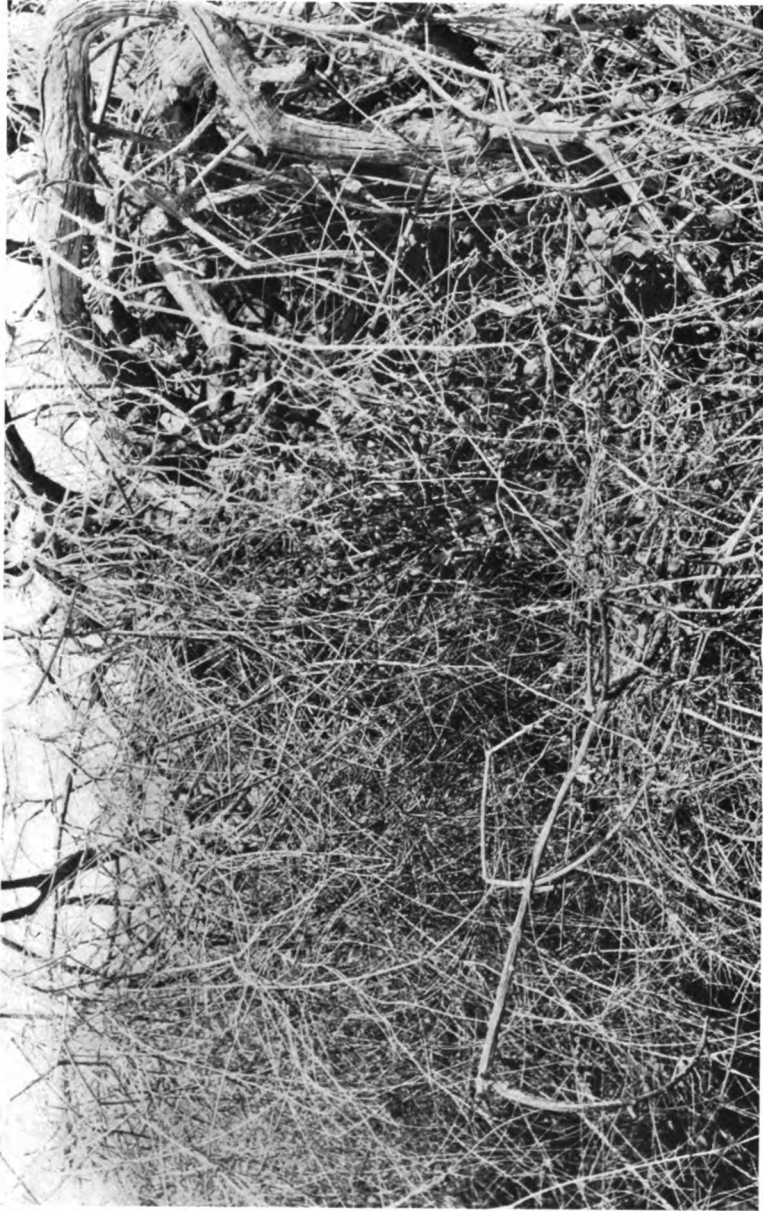
INHABITANTS OF THE GHOR—NATIVE FAMILY

and poorest habitations we have seen. The one pictured on p. 287 (Native tent), with our soldier Hashim and two of the women in front, is the best one we could find. The photograph marked "Native family" gives a better idea of the way in which the inhabitants and animals are crowded into the "circles." This row of Arabs gives some idea of the people. Next to the American on the left is one of our travelling company from Maan, but the remainder are all Ghawarneh. These people irrigate wide fields, plant wheat and maize, grow some cotton and indigo, and own two or three hundred camels, which graze in herds about the region. They have been much oppressed by the dwellers in Kerak and about Petra, and lead a most miserable existence. The pains they take to hide their dwelling-places among the thorns, the dense hedges about the fields, the absolute lack of fixed roads, the hidden paths in the jungle, all testify to the relations they sustain toward each other and toward the wild men and animals of the surrounding regions. For a century they have robbed and maltreated nearly all the travellers who have ventured among them, but the strong arms and cruel hands of the Turks have beaten them into semi-submission and fear. Hashim and Hsein, our soldiers, spent two hours in bullying them into supplying guards for our camp, and in arranging the details for the night. Our muleteers formed the inner circle, Hashim and Hsein were a patrol, and the Kaabinehs were compelled to make a

larger circle, and keep huge bonfires going all night. By such precautions we defended ourselves successfully.

The night was warm and still. The region is a paradise for dogs and jackals, whose voices and bodies it is hard to distinguish. It would be impossible to say about any of the camps, just where the species jackal ended and the species dog began. They are almost one family. The mosquitoes came in swarms about our tents, and had we remained a second night these pests would no doubt have made themselves at home with us. In extended conversation with the people, they assured us that every living being in their camps suffered from fever and ague every year of his life, and that the attack lasted from one to two months. The very dogs lost their hair, and the poultry their feathers, and by November of each year, the camps were charnel-houses. When we looked at the fever-shaken, furrowed countenances of the straggly-haired specimens of the human frame in the men who spoke to us, we were constrained to believe their accounts. When the sick and the blind began to crowd around us asking for aid, we wished that our good friend Doctor Post had been able to carry out his cherished desire of accompanying us. We gave from our stores of medicine, and only wished we could have done a hundredfold more for these burdened people.

Lord Kitchener and a party were camping in



THE GHOR—APPLES OF SODOM



ROAD ACROSS SALT MORASS, SOUTHERN END OF DEAD SEA

this region in 1883, the day before Christmas, when a sheikh with four Arabs came in, twenty days from Cairo, bearing a letter from Sir Evelyn Baring, telling of the terrible defeat of Hicks Pasha's army in the Soudan. One cannot but wonder if Lord Kitchener, even for a moment, dreamed that he was to be the instrument in God's hands to avenge that catastrophe, some few years later at Omdurman.

We broke camp next day at seven A.M., and started on one of the most trying stages of our whole journey. In half an hour, led by our guides from the Kaabineh, we were clear of the trees and brush and out in the Sebka (Psalm cvii., 34), a region of slimy sand flats, with coatings of salt and treacherous-looking depressions where the watercourses run in the winter season. For two hours we wound along over this morass (see Dead Sea salt morass, p. 295) by the slippery path that here and there threatened to drop us into the quicksands below. Our guides led us along a trail consisting of footprints of animals going and coming, until we seemed half-way across, when to our disgust the footprints proved to be those of a lot of salt gatherers from Kerak, who went to a running stream, loaded their animals, and returned. It was absolutely impossible to go any farther, and we retraced our trail for several miles, just in time to keep our caravan from following us. The guides kept fifty yards in advance, testing the treacherous-looking places with their feet and long sticks; but more than

once one of our leading horses sank through the clay, and floundered badly before we could extricate him. Each such soft place involved a long detour to the south, until we had crossed all the brooks running down from the mountains of Edom.

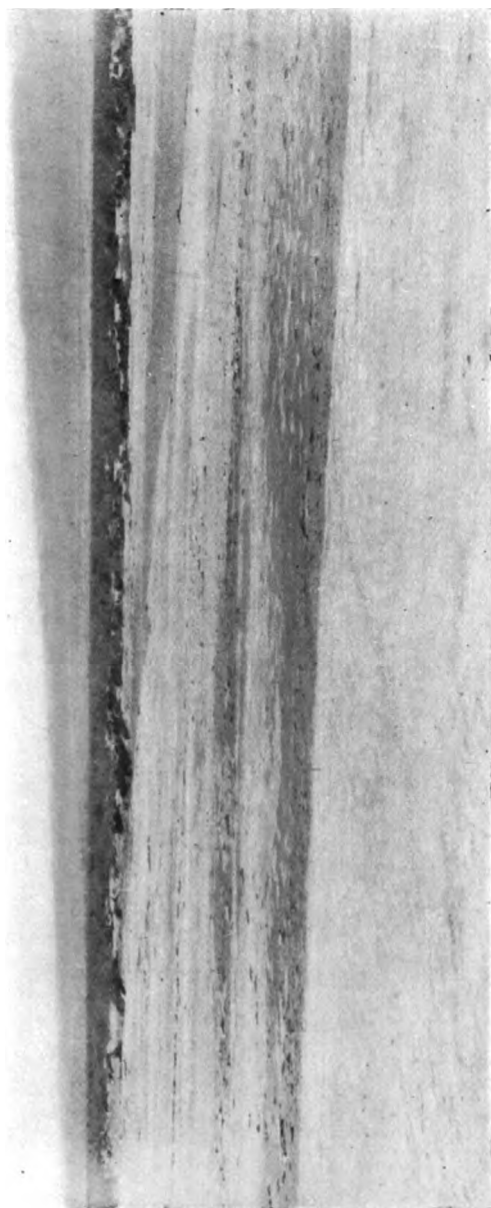
Towards the south, at a distance of about five miles, we saw a clearly defined band of light-colored rock (see picture, p. 295, Road across Salt Morass) of a height of from one hundred to two hundred feet, which completely crossed the whole valley.

This wall presented what appeared to be an unbroken face, but which must have been cut down to the level of the morass at the points where the stream flowing northward along the Arabah have their channels.

In this cliff we have the northern boundary of the sandstone plug in the lower portion of the main valley.

In the picture, p. 299 (Western side of Salt Morass), we can see the continuation of this wall up the western side of the valley towards the southern end of Jebel Usdum. At this point it is much broken down by the streams which come in from the western mountains, but as a structural line it is continuous throughout the whole extent of this great area.

It may be that this whole surface was once below the surface of the Dead Sea, for it is composed of silt, which might have been brought to it by the tremendous activity of the many streams which



WESTERN SIDE OF SALT MORASS



JEBEL USDUM FROM THE SOUTH

lead to it from all sides. A slight change in elevation would account for all its peculiar features, and also explain the position of the delta at the mouth of the Ahsa.

Even though we had made an early start, the heat became intense and our thirst excruciating. It was a strange experience, after the foul waters of the Bir Mlih, those of Alebrash camp, and those of the Ghor es Safiyeh, to reach a point where the horses walked in crystal brooks for half an hour, the heavens like brass above, the heat increasing, and not a drop of water to drink! For these limpid streams beneath our feet were all so bitterly salty or sulphurous that neither man nor beast could touch a drop of them. An hour of this in that salt desert was an experience we can never forget.

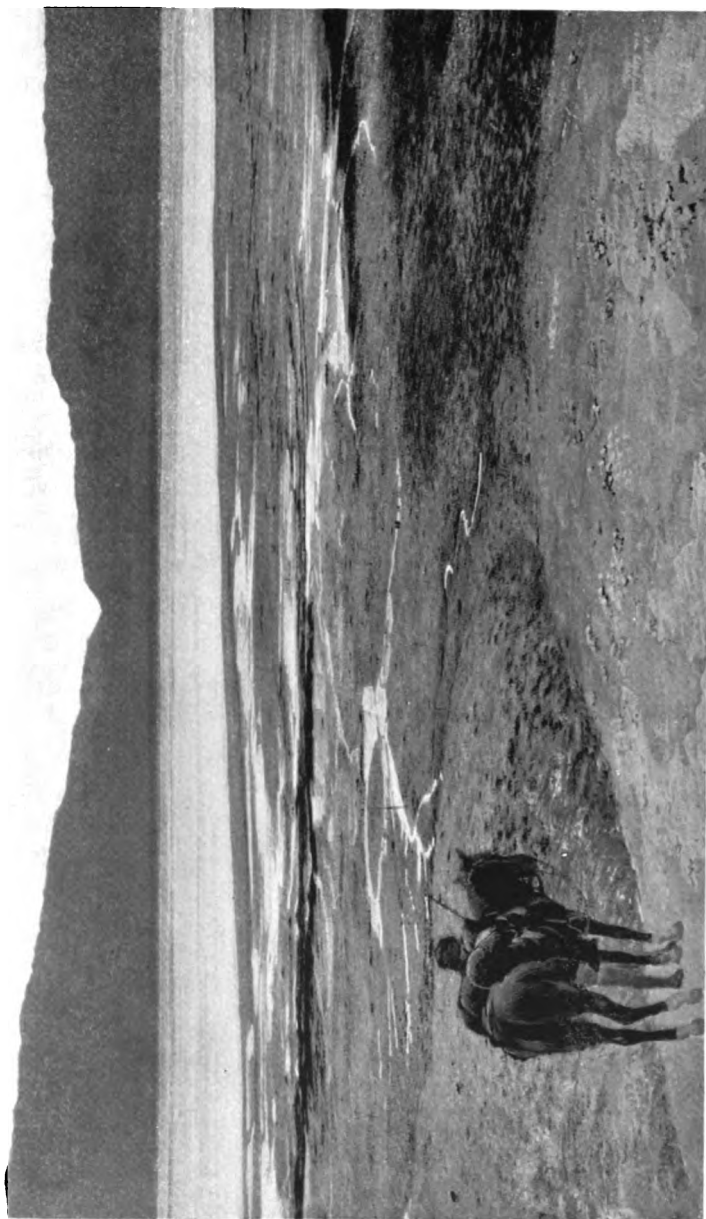
When once clear of this salt morass, our Kabineh guides begged to be allowed to return, and after getting our bearings well we paid them and let them go. Sending our caravan on ahead we then took one soldier and made the attempt to pass along the shore of the Dead Sea to the east of Jebel Usdum, which now loomed up in front of us. We rode until the horses were trembling at the slimy, sinking crust beneath them. Then we left them and proceeded on foot for a few hundred yards, and assured ourselves that no road now exists along that quicksandy shore, and that it would be suicidal to attempt to cross these foamy crusts of salty sand, beneath which lay depths of soapy mire into which a horse and rider could easily

disappear forever. One of our horsemen had experienced such an accident a few years before and came near being lost.

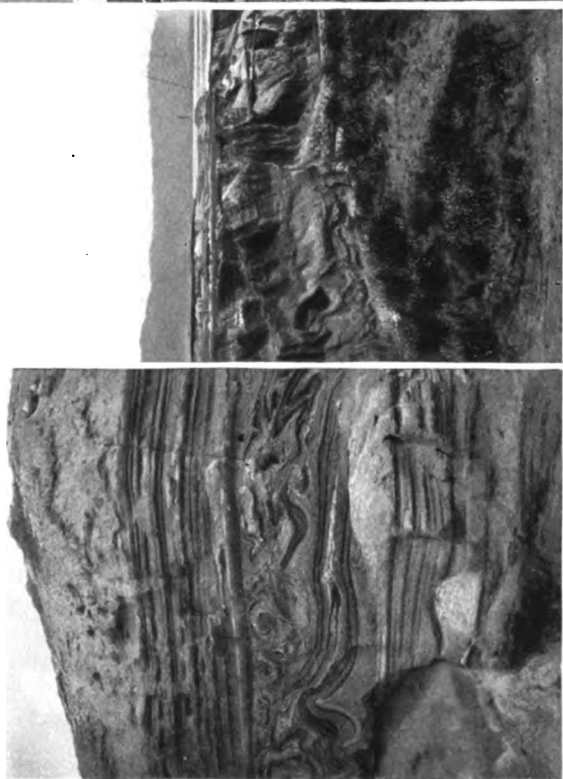
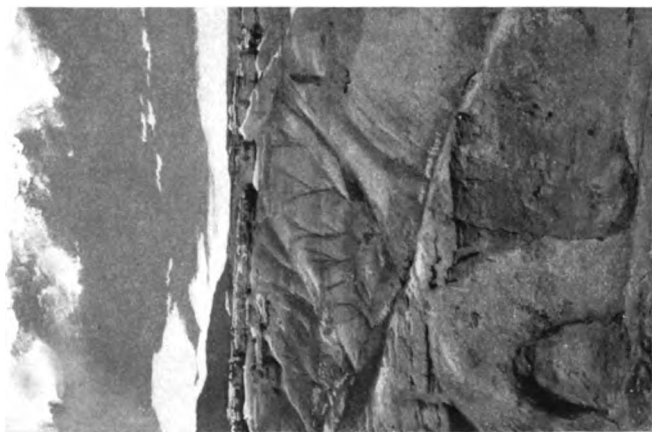
We saw two gazelles galloping along the shore northward, and we shot one partridge near the southern end of the mountain.

Following our caravan for an hour, and climbing into Wady el Emaz, we were soon seven hundred feet above the Dead Sea, and moving along on a chalky plateau to the west of Jebel Usdum. The mountain is about four miles long and at places seven or eight hundred feet high. The lower two or three hundred feet of this height is a mass of solid rock salt, whose upper level is easily traced by the wet line caused by the constant collection of moisture by the salt.

Suddenly the road left the plateau and dropped into a long, narrow valley, called Wady Mikhbar, at first some ten feet deep and five feet wide, but cutting deeper and deeper into the soft strata until it was a hundred feet deep and ten or twelve feet wide, winding in the most curious way imaginable, and revealing beautiful examples of erosion at a thousand places. It is an ideal lurking-place for highwaymen, and in the heat and drought of noon-day it is an oven. Travellers who can so arrange it will do well to make this passage in the early morning or by night. It emerges in a wide torrent-bed at the northern end of Jebel Usdum, and just here is obtained the best view of the great masses of rock salt, and the quarry from which the Hebron



DEAD SEA BEACH FROM JEBEL USDUM



CALCAREOUS SANDSTONE, BACK OF JEBEL USDUM

merchants cut the blocks which they carry to Jerusalem. We detached large specimens with difficulty, having no tools.

This plateau west of Jebel Usdum is a remnant of the sandstone deposit in the main valley, in this case of a peculiar calcareous character. Some of its upper portion has been removed by erosion, as is seen by a glance at the picture, p. 311 (Mountains to the west of the northern end of Jebel Usdum). The limestone mountains are seen in the background of the picture, but the horizontal belt of a lighter color extending through the whole width of the picture is the lighter-colored sandstone. It is much eroded at this point by streams coming from the westward, but is practically continuous along the face of the mountains on the western border of the plateau back of Jebel Usdum, and as far south as our glasses enabled us to see beyond its southern end, along the western side of the main valley. The plateau itself is undergoing erosion both to the north and south, through the agency of the waters collecting upon its surface. The gullies thus cut out were the pathways we took to reach it, and descend from it.

We next rode northward and down to the shore of the Dead Sea, where we took a swim in its thick, oily waters. Contrary to our expectations we did not find the bottom slimy, but clean and clear, and with splendid banks of clean pebbles for miles. Nor did we suffer any of the incon-

veniences or smartings of the skin which some travellers have complained of, while in the water.

The taste of the water was something which caused its immediate expulsion from the mouth; and when it touched the eyelids they burned under its acrid stimulus.

A gathering storm compelled us to cut short the delightful bath we were experiencing. When we went into the water the temperature of the air was 82° F. and that of the water 72° F., but when we reached the shore there had been a drop of 20° in the temperature of the air, a change which made our teeth chatter with the cold. A strong wind was blowing, and this dried our bodies and left them coated with salt before we could rub ourselves down. The salt filled our hair, and was as generally disagreeable as possible. The irritation thus produced lasted for many hours, and made our flesh tingle.

While we were bathing our caravan had turned up a narrow gorge in the desolate slope, and when we overtook it an hour later they were preparing to camp at a place called Zaweirah the Lower. Its only claim to being made a resting-place is the existence of some pools of filthy water, defiled and fouled by passing man and beast. It is a wild spot among the towering rocks, once defended by a picturesque castle and some other buildings, but the most desolate and uncomfortable place that we ever pitched our tents in. After the plunge down the Edom slope, the lack of water in the two



MOUNTAINS TO WESTWARD OF NORTHERN END OF JEBEL USDUM



NORTHERN END OF JEBEL USDUM
The Darker Portion is Rock Salt

camp, the distressing, tantalizing effect of the undrinkable brooks in the salt morass, the oven-like heat of the winding, chalky valley, and the fatigue of an eight-hours journey, we found in Zaweirah the most trying night of our trip. Almost before the cook had secured enough of the foul water to cook our supper with the tired muleteers had coaxed their weary animals across the rocks to the pools, and using one of our cooking vessels as a bucket, were washing both mules and donkeys in the water which we were expected to drink! For the water poured over their sweaty bodies found its way over the smooth rocks into the pool again. Such utter stupidity and crass disregard of the desperate needs of any travellers who might be following us almost upset our patience, and we made those rocky valleys ring with our condemnations of their conduct, where the stake was one of life and death. Foul as the water was when we arrived, we were devoutly thankful to find any at all in the pools. Green, and filled with creeping things, it was able to sustain life, and the spectacle of those muleteers adding to its impurities by washing their sore-backed animals in it was a specimen of man's inhumanity to man, that might well make angels mourn. During the night the winds swirled up that narrow gorge, flapping and twisting our tents, blowing the dust and pebbles into our beds, which sloped at unsleepable angles, and kept the whole camp awake, when every man and animal was almost dead with exhaustion. But after their

scolding over the matter of the water, the men seemed penitent, and out of compassion we shared almost everything we had in the shape of food and drink, and gave them all the tobacco they could use. In truth, the whole camp supply of food was getting low after our stay in Petra, and the region between Tafeleh and Hebron was a howling wilderness. Our guns gave us game, but there was neither milk nor eggs nor vegetables among the rocks and ravines of the Dead Sea region.

Our barometers registered at Zaweirah about four hundred feet above the Dead Sea and eight hundred and ninety-two feet below the Mediterranean, but in fifty minutes after leaving camp we had climbed over thirteen hundred feet, and were moving along on a well-beaten road through a flinty desert, gradually ascending until we came into the region of Bedawin camps, and at length of ploughed fields. We saw few human beings of whom we could inquire the road, but we knew the general direction, and never missed our way.

About four in the afternoon we camped in a narrow valley, by a well called Bir Im Hashim, with plenty of clear water in it, and which we took care to guard against any such defilement as that which took place at Zaweirah.

The night was cool and refreshing, and our animals greatly enjoyed the green grass after the rocks of Petra and the desolation of the shores of the Dead Sea. The next day turned out showery, so that we packed up our shotguns—and bewailed



THE DEAD SEA, FROM THE NORTHERN END OF JEBEL USDUM

our mistake almost immediately, as we saw perhaps thousands of blue rock pigeons during the day. Not fearing highwaymen in this vicinity, we pushed on ahead of our caravan, and entered Hebron about noon. We sent the *third* message over the new telegraph wire, and announced our safe arrival to friends in Jerusalem and Beirut. Some of the *Celtic's* passengers were down from Jerusalem for the day, and among them we discovered acquaintances.

We pitched our last camp on the green threshing floors before the town. We received callers and made calls. Then Milhem the dragoman, Butrus the cook, Kasim the table boy, and all the mule-teers did their best to make our last night in the tents as bright and as pleasant as food and good nature could render it. Everybody was grateful and happy at the safe ending of our splendid journey.

The next day dawned showery, and soon after the caravan was in motion the rain came down in torrents. The storms we did not have in February and the first half of March seemed to have repented of having given us so much good weather, and were eager to soak us well at the last opportunity. We packed all our guns, we donned our rubber clothing, and we faced the storm the live-long day. But it could not dampen our spirits. The plains of Moab, the mountains of Edom, the frightful descent down almost impassable ravines, the treacherous morasses around the sea of death, the trying ascent among the scorching chalky

valleys, the dearth of water, the parching thirst, the fatigue, the dangers,—were all behind us, and in front the welcome and tidings from friends and loved ones waiting and watching for us in Jerusalem—a beautiful ending to a wonderful journey. It will stand ineffaceably in our memories as a picture of human life.

We close this narrative with an ascription of *praise* and *thanksgiving* to the kind Father that fulfilled the dream of many years, and guided us in safety from the beginning to the end. We wish for each reader, after the pleasures and service of life begin to wane, and the pathway plunges downward into the valley of the shadow of death, that he or she may be guided in safety over the flood, and, climbing the slopes beyond, find a glad welcome in the heavenly Jerusalem—the goal of every child of God.





NORTHERN SHORE OF THE DEAD SEA
Varying Beach Levels

APPENDIX I

TRAVELLING TIME

Sidon to	Jezzin . . .	7	hours	Muleteers	8	hours
	Jedeideh . . .	7	"	"	8	"
	Banias . . .	5	"	"	6	"
	Ulleka . . .	7	"	"	8	"
	Tabigha . . .	8	"	"	9	"
	Tiberias			"	3	"
	Gadara . . .	6½	"	"	8	"
	el Husn . . .	7½	"	"	9	"
	Jerash . . .	6	"	"	7½	"
	Remamin . . .	6½	"	"	7½	"
	Naur via Salt . . .	9½	"	direct	8½	"
	Madeba . . .	4	"	"	5	"
	Diban . . .	6	"	"	7½	"
	Arnon, Guard-					
	house . . .	6	"	"	7½	"
	Kerak . . .	7	"	"	8	"
	el Ahsa . . .	5½	"	"	7	"
	Tafleh . . .	4½	"	"	6	"
	Ain el Gelai-					
	dat . . .	4	"	"	5	"
	Shobek . . .	5	"	"	6½	"
	Sik, Petra . . .	6	"	"	6½	"
	Petra . . .	1½	"	"	1½	"
	to Mt. Hor . . .	2½	"			
	Shobek . . .	7	"	"	7½	"
	Buseirah . . .	6	"	"	6½	"
	Tafilch . . .	3½	"	"	4	"
	el Abrash . . .	7	"	"	8	"

Ghor Unsur . . .	5	hours	Muleteers 6	hours
Zaweirah . . .	8	"	" 8	"
Bir Im Has-				
him . . .	7	"	" 8	"
Hebron . . .	4	"	" 6	"
Jerusalem . . .	7	"		

APPENDIX II

ELEVATIONS TAKEN BY MEANS OF THREE ANEROID BAROMETERS

Jezzin—walnut trees	3300 feet
Jedeideh—school	2540 "
Banias—bridge	1200 "
Ulleka—threshing floor	1725 "
Tabigha—camp	620 "
Tiberias—camp	620 "
Gadara—North theatre	1215 "
el Husn—threshing floor	2150 "
Jerash—fountain	1757 "
Remamin—threshing floor	1850 "
Naur—fountain	2740 "
Madeba—church	2800 "
Diban—	2460 "
Guard-house, Arnon	2800 "
Kerak—parade ground	3400 "
el Ahsa—river	1650 "
Tafileh—telegraph office	3650 "
Ain el Gelaidat—spring	5250 "
Shobek—in fortress	5000 "
Sik—Petra	3600 "
Khazneh	3300 "
Petra—Arch of Triumph	3000 "
High Place	3700 "
The Deir	3750 "

Mt. Hor—tomb	. . . . .	4600 feet
Ghor—el Abrash	. . . . .	1150 “
Dead Sea	. . . . .	—1290 “
Zaweirah .	. . . . .	—950 “
Bir Im Hashim	. . . . .	2000 “
Hebron . . . . .	. . . . .	3000 “

APPENDIX III

SOME OF THE TRAVELLERS WHO HAVE LEFT RECORDS OF VISITS TO PETRA, DURING THE PAST ONE HUNDRED YEARS

1811	Burckhardt.
1818	Irby and Mangles.
1827	Laborde and Linant.
1837	John Stephens.
1838	Edward Robinson.
1840	Stephen Olin.
1852	Dean Stanley.
1870	Palmer.
1882	Edward L. Wilson.
1883	Hull, Kitchener, and Armstrong.
1895	Forder and Hornstein.
1896	Gray Hill.
1896	Brunnow and Euting.
1898	Sir Charles Wilson and Hornstein.
1898	Samuel Ives Curtis.
1900	George L. Robinson.

APPENDIX IV

THE HEDJAZ RAILROAD

Among the cherished projects of the present Sultan, Abd ul-Hamid, and by far the most ambitious, is the realization of the Pan-Islamic idea, *i. e.*, the union of all Mohammedan

peoples under the spiritual headship of the Khalif-Sultan. Attempts to achieve or secure this have met with many rebuffs outside of the Empire but within the Sultan's domains nothing has attracted more attention than the plan to build a railroad along the old pilgrimage route from Damascus to Mecca, a distance of not less than eighteen hundred kilometres. The official name of the project is the Hamidian Pilgrimage Railroad, linking the name of the ruling Sultan with one of the "five pillars" of the Mohammedan faith, viz., the Pilgrimage to Mecca. Very early in the discussion of the project the Shereef of Mecca objected to having the Most Holy City defiled by foreign rails and Medina was named as the southern terminus, fourteen hundred and ten kilometres from Damascus, so that since then the plan is spoken of as "joining the two holy cities, Damascus and Medina."

After nearly five years of feverish activity, as things go in Turkey, they have succeeded in completing the first section, to Maan, a distance of four hundred and seventy kilometres, which is exactly *one third* of the distance to Medina. This section was opened September 1, 1904, the anniversary of the Sultan's accession, by a great commission which came down from Constantinople by special steamer and was carried at enormous expense all the way to Maan for the opening ceremonies.

Rumors are now current that instead of going on toward Medina, a distance of nine hundred and forty kilometres, the road will swing westward to the head of the Gulf of Akabah (two hundred and fifty kilometres) and end there some distance from the Egyptian frontier. This would be to join the pilgrimage route from Egypt. What the engineering difficulties are along this east coast of the Gulf of Akabah no one yet knows, but it will certainly be a much more difficult route than by the old desert road. This change again raises the doubt whether the road was ever really meant to be carried toward Medina.

It is a *government* railroad and is being built under the direct control of the Sultan, who sends down the higher offi-

cials of his Imperial household to serve for longer or shorter periods in the great work. It can be imagined that such a policy does not conduce to economy in any department !

It will be one of the most remarkable railroads in the world in its financial aspects. It can never be made to pay. It is being built by gifts from pious Moslems all over the world and by a series of stamp and other acts inside the Ottoman Empire that are unique even in Turkish history. When the voluntary gifts, which were perhaps less than one hundredth part of the cost required, grew slack the Sultan began to issue Imperial Rescripts and has kept up this process until there are stamps or imposts on nearly everything in the Empire. A stamp of one piastre (four cents) was levied upon every petition presented to the government authorities for every conceivable purpose. Then came a house tax of five piastres on every house in Constantinople. Provincial governors were expected to follow this shining example. Later on the Sultan decided upon a minimum tax of five piastres upon every Moslem male in the Empire and the over-loyal periodicals published articles declaring that Moslems in all lands ought to accept this call willingly and render the same tribute to their spiritual head ! The Rescript gave careful directions that five piastres was the minimum for the poorest but all who could were to pay according to their ability. Then the salaries of all government officials were treated to a per centum assessment. Then all owners of *decorations*, and they are myriad, were directed to make a *thank offering* according to the grade of their decorations and the scale of gifts was published in all the papers ! Then wood and coal was subjected to a new impost and then every parcel coming through every custom house in the Empire. Another Rescript directed that all the skins of all the animals slaughtered in the government slaughter houses should be devoted to this holy project. The stamps were gradually extended to all commercial papers, deeds, etc., and all the foreign Embassies put in their protests. The road is nominally built by the followers of the prophet, but these stamp acts have put both the Christians

and the foreigners under tribute ! Almost every department of the government has been obliged to make some contribution to this pet scheme of the Sultan. There have been times of financial stringency when foreign sellers of railroad plant have been ungracious enough to require a cash accompaniment to orders for rails and rolling stock. As the rails have lengthened the expenses have increased and no one can see the end of the project on the present basis.

German engineers surveyed the road, Americans are now supplying a large part of the rails, but the work of digging and grading has been done mainly by *the battalions of regular soldiers* sent down along the line for that purpose. Special inducements have been offered to those who will use the pick and shovel instead of the rifle—one year of the railroad service counting as two years of their compulsory military service. So that even the military establishment of the Empire has been affected by this marvellous project. This will explain how the four hundred and seventy kilometres already opened have been completed at an apparently small expense.

Up to the end of the fiscal year 1319, that is, April, 1904, there had been collected from all sources 132,637,027 piastres, or about \$4,740,000 ; the first and the largest item on this list being 74,215,380 piastres (\$2,650,000) from the skins of slaughtered animals !

APPENDIX V

EXPLANATION OF THE PHOTOGRAPHS OF THE MOSAIC MAP OF MADEBA

The following information will serve to explain the ten plates of this interesting map, which are given herewith, and which are photographic reproductions of the larger plates referred to in Volume I., Chapter XII., page 260, of this work.

Plate I. gives the general view of the chart.

Plate II. contains the course of the Jordan from Aenon to

Bethabara. Galgala and Jericho are seen near the middle of the right side of the plate.

Plate III. shows the mouth of the Jordan in the Dead Sea. Near the centre of the upper side is Callirrhoë. Bethabara is near the mouth of the river, and Jerusalem is located at the bottom of the plate.

Plate IV.—The plan of Jerusalem and its environs. The city is divided into two portions by a long colonnade, running from north to south, and the three principal gates are shown.

Plate V.—The extreme eastern portion of the map. At the top of the plate, Kerak is seen, placed on the summit of a mountain. The dark portions represent the mountains, while the long white line represents a torrential stream running from Kerak to the Dead Sea.

Plate VI.—Southern portion of the Dead Sea. The legend at the top gives the three names—the Salt Sea, Asphaltite Lake, and Dead Sea. The trees in the neighborhood of Zoöra at the right side are noteworthy.

Plate VII.—The territory occupied by the tribe of Judah, with the name at the top of the map. The third name below this is Beth-Zacharia, and the church is shown. In the small separate portion Ascalon is to be found.

Plate VIII.—The desert of the Exodus, and the territory of Simeon. The place where the brazen serpent was shown is marked, as also the place where the manna fell. The frontier towns of Egypt are seen at the bottom of the map.

Plate IX. shows much of the above chart, but gives a better idea of Gaza on the left, and Pelusium on the right.

Plate X.—Lower Egypt and the mouths of the Nile. Sinai is represented at the top of the map. The branch of the Nile at the left is called the Pelusiac Branch. The central portion is called the Sebenitic, and has three mouths.

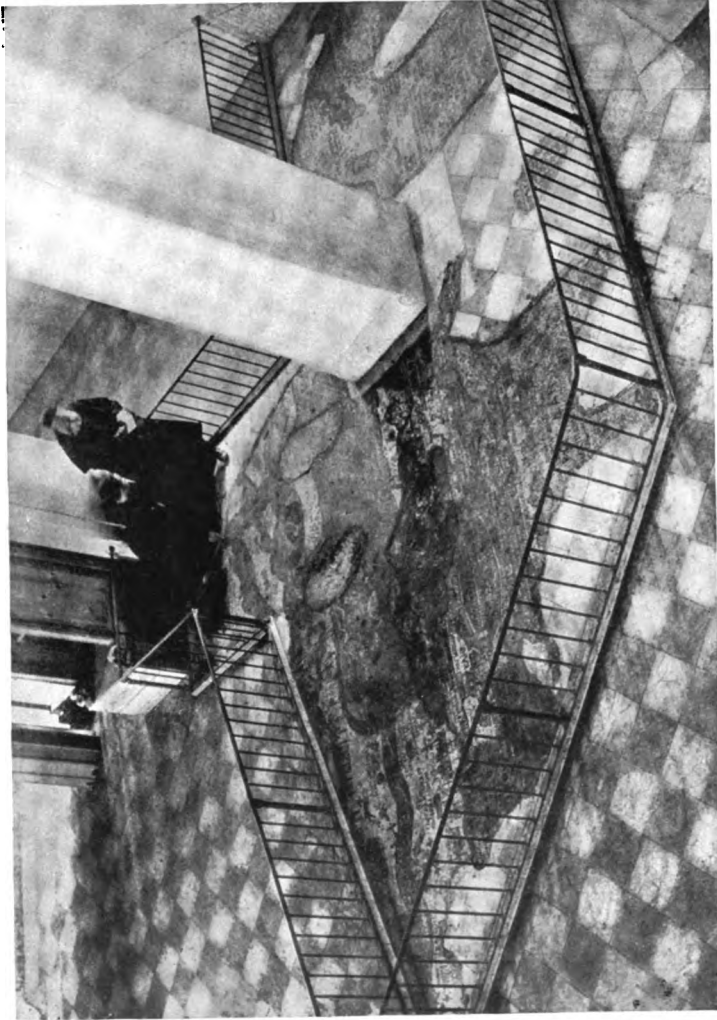


PLATE I



PLATE III



PLATE IV



PLATE V

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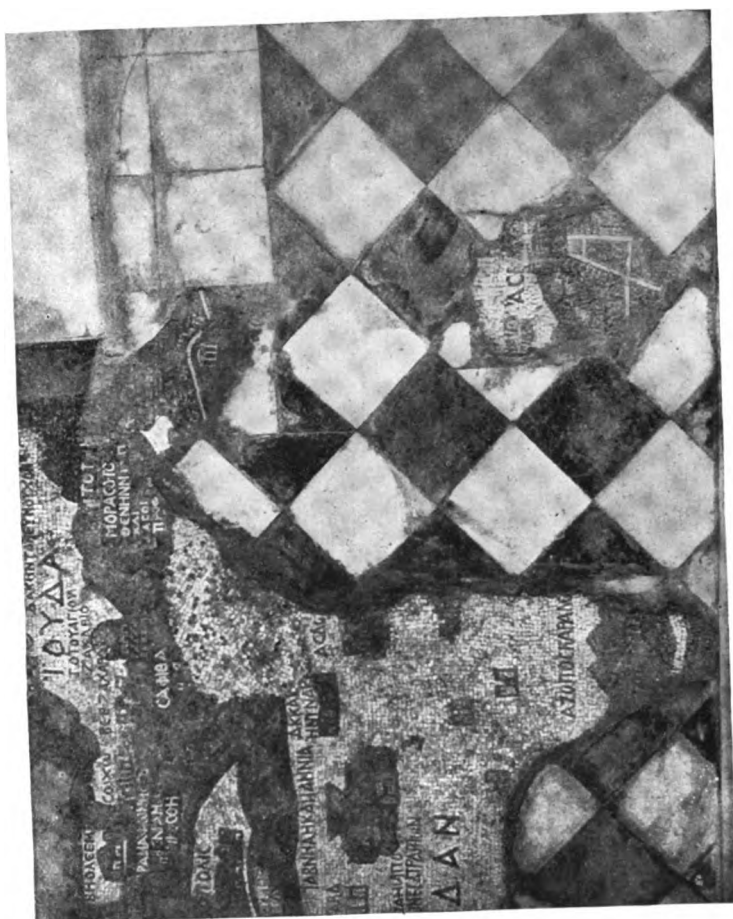


PLATE VII



PLATE VIII

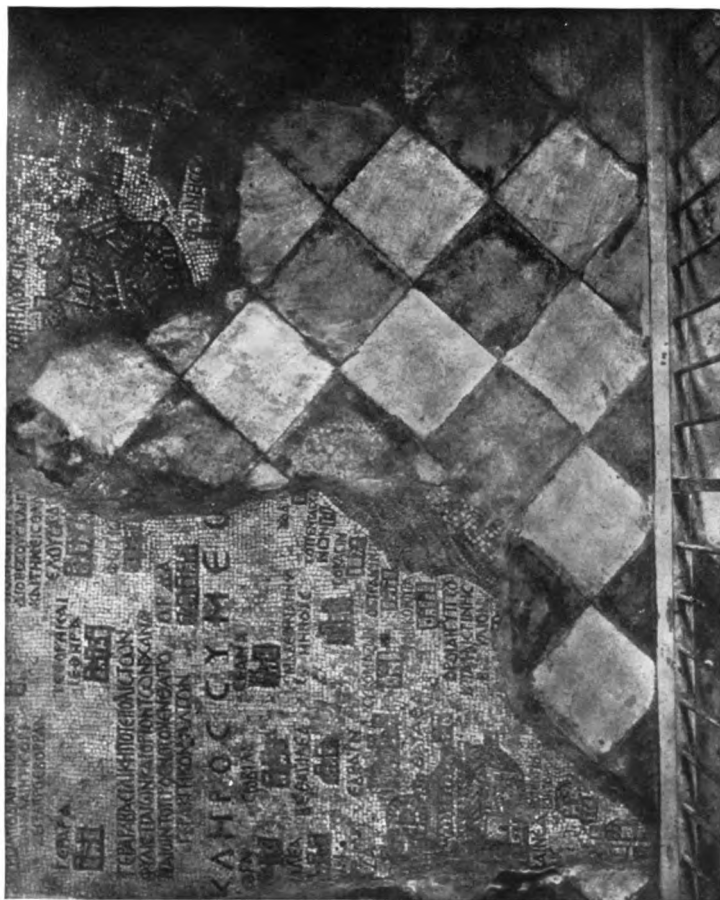


PLATE IX



PLATE X

APPENDIX VI

SCRIPTURE REFERENCES

Genesis iii., 27, 28 . . .	I., 277
Genesis x., 15-19 . . .	I., 44
Genesis xiv., 5 . . .	I., 254
Genesis xxii., 22 . . .	I., 229
Genesis xxv., 17 . . .	II., 62
Genesis xxxii., 10 . . .	I., 119
Genesis xxxii., 41-52 . . .	I., 277
Genesis xxxiv., 1-8 . . .	I., 277
Genesis xlix., 13 . . .	I., 270
Genesis xlix., 25 . . .	I., 270
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2 Samuel viii., 14	II., 61
1 Kings xi., 17	II., 184
1 Kings xv., 20	I., 83
1 Kings xv., 29	I., 83
2 Kings iii., 4	I., 255, 256, 333
2 Kings iii., 9	I., 334
2 Kings iii., 25	I., 256
2 Kings iii., 27	I., 254, 333
2 Kings xiv., 7	II., 64
2 Kings xxiii., 13-17	II., 184
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2 Chronicles xxv., 11	II., 61
2 Chronicles xxv., 12	II., 64
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Isaiah xvi., 1	II., 64
Isaiah xlii., 11	II., 64
Ezekiel xlvii.	I., 154
Obadiah, 3	II., 64, 65
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Matthew xvi., 18	I., 102
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Mark vii., 31	I., 165
John xxi., 9	I., 131
The Acts ix., 23	II., 63
2 Corinthians xi., 32	II., 63

APPENDIX VII

FOSSILS AND ROCKS COLLECTED IN SYRIA

NOTES BY GILBERT VAN INGEN, CURATOR OF INVERTEBRATE PALEONTOLOGY, E. M. MUSEUM OF GEOLOGY, PRINCETON UNIVERSITY

The collection of fossils and rocks brought back by Professor Libbey in 1902 from the vicinity of the Jordan Valley in Syria were obtained at four localities, namely, Mejdal Shems, Jerash to El Remamin route, Kerak vicinity, Petra vicinity.

The material from Mejdal Shems includes a few pyritized ammonites (Nos. 5336-5339) and a couple of non-pyritized rhynchonellas (Nos. 5340-5341), all of Jurassic age. The ammonites are species well known in the Brown Jura of Württemberg, Germany, and, indeed, their condition of preservation is quite similar to that of the pyritized Württembergian specimens. The rhynchonellas are in a different matrix evidently derived from another horizon of the Jurassic than that which furnished the ammonites, but no notes on their relative positions can be given, as all the specimens from this locality were packed in a single package with only one label.

A lot of fossils labelled "Jerash to El Remamin" can be separated into two distinct groups, apparently derived from two separate beds, one a yellowish limestone containing crinoid plates and echinoid spines (Nos. 5342-5345); the other a cream to light buff chalky limestone containing pelecypods (Nos. 5346-5355). These fossils represent a phase of the Cenomanian stage of the Cretaceous.

The material from vicinity of Kerak consists of cherty limestone or, more strictly, of chert layers with chalky limestone partings. The surfaces of the chert blocks are covered with fossils, chiefly shells of gastropods, which are fairly well silicified so that etching with hydrochloric acid often improves the specimens for purposes of study. Two distinct faunas are represented in this lot from Kerak. The more interesting

fauna is an assemblage of gastropods, scaphopods (*Dentalium*), ammonites, *Baculites*, and pelecypods, which are described below under numbers 5356-5370; the other fauna is that of an oyster-bank containing agglomerated oyster-shells of two species, with unrecognizable fragments of other pelecypods, described under numbers 5371-5372. The associations of these entirely distinct faunas are unknown. The rock containing the gastropod fauna is a light bluish gray chert that weathers to a cream-colored chalk; the chert of the oyster-bank is likewise bluish gray, but all its weathered surfaces are reddish buff. The age of this gastropod fauna appears to be Senonian. More positive identification cannot be made, as the works of Diener and Blanckenhorn on the Cretaceous faunas of Syria have not been accessible.

The material from vicinity of Petra consists of a few specimens of reddish brown sandstone (Nos. 5373-5375) from the so-called "Nubian sandstone," which is considered by most writers upon Syrian geology to occupy a horizon low in the Cretaceous series of that region. No fossils occur in the few specimens at hand.

NOTES ON THE FOSSILS

The identifications herein made are based on the published descriptions and illustrations found in the works cited at the end of these notes. Direct comparison with well-authenticated specimens has been impossible. The illustrations on the accompanying plates have been reproduced directly from untouched negatives. Some of the figures are enlarged, others reduced, and in all cases the dimensions of the original are given in the explanations to the plates. The numbers are those under which the specimens are catalogued in the E. M. Museum of Geology and Archæology of Princeton University.

JURASSIC FOSSILS

The Jurassic beds of the vicinity of Mejdal Shems, on the route from Banias to Damascus, are described by Fraas (Orient,

ii., p. 14) as presenting (a) the White Jura, a gray, rapidly weathering, marly limestone 20 metres thick containing a great abundance of *Rhynchonella lacunosa*; (b) a middle zone of dark gray clays 1.5 metres thick with *Ammonites hecticus*, *convolutus*, and other species characteristic of the Ornatenthon of the uppermost Brown Jura of Germany; and (c) the lowest bed, of greenish gray sand and clay marl with *Rhynchonella concinna*, *Terebratula perovalis*, and *Pecten subarmatus*.

The few Jurassic fossils in our collection from the above locality comprise four species of isolated pyritized ammonites, and two species of non-pyritized rhynchoneilas. The ammonites have undoubtedly come from Fraas's zone (b), the Brown Jura; the brachiopods from zone (a), the White Jura. The species have been identified as follows.

5336. *Aspidoceras perarmatum* Sowerby. (Plate C, Fig. 1.)

D'Orbigny, Paleontol. Franc., Terr. Jur., Pl. 184.
Quenstedt, Jura, Pl. 75.

A single specimen without the living chamber and outer whorls, but showing finely the sutures of what appears to be the third or fourth whorl. The specimen has the apical whorls, probably two of them, missing, and two whorls are shown. The length is 42 millimetres; the truncated whorl measures 18 mm. wide and 15 mm. high. Fraas, 1877 (in Jurasch. am Hermon, p. 26), cites this species as being represented among his "Medjdel esch Schems" material by very large individuals.

5337 (a and b). *Perisphinctes convolutus evexus* Quenstedt. (Plate C, Figs. 2, 3.)

Quenstedt, Petr. Deutschl., Ceph. Plate 13, f. 1-6.
Quenstedt, Ammon. Schw. Jura, ii., Plate 81, f. 15-19.

This species is represented by two well-preserved internal casts of adult individuals. One of these (5337a) exhibits finely the sutures, surface folds, constrictions, and in particular

the pair of scars anterior to the last two constrictions. These scars apparently indicate the positions of the lateral apertural lappets during earlier stages of the ontogeny of this individual. The nature of these scars does not appear to have been deemed worthy of consideration by Quenstedt, who figures them (Ammon. Schw. Jur., vol. ii., pl. 81, f. 13, 14; also vol. iii., pl. 100, f. 6, pl. 104, f. 8). On pages 924 and 953 of the same work he mentions them as follows: "Exemplar zeichnet sich durch parabolische Schnirkel in den Rücken-kanten aus, doch lege ich darauf keinen Werth, da sie beliebig erscheinen und beliebig verschwinden." And further on: ". . . und doch scheinen sie ihr mehr oder weniger deutliches auftreten einer Missbildung zu danken." Oppel (Paleont. Mittheil., Stuttgart, 1860-65) considers the presence of these scars as indicative of specific differentiation, but gives no indication of his opinion regarding their morphological significance. Dimensions: Longest diameter, 26 mm.; width body whorl, 17.7 mm.; height of body chamber, 7 mm.

5338. *Creniceras renggeri* Oppel. (Plate C, Fig. 4.)

Ammonites dentatus Quenstedt, 1858 (pars), Jura, Taf. 76, f. 8 (not 6, 7).

Creniceras renggeri Oppel. Zittel-Eastman, Pal., i., p. 569, f. 1178.

This species is represented by a single specimen, wholly pyritized, showing the small umbilicus of the younger interior convolutions, which becomes wider in the adult stage; the smooth surface, and the ventral crenulations of the round-acute keel, as figured by Quenstedt. The dimensions of our specimen when viewed from the side are: height, 23 mm.; width, 19 mm.; thickness of the body chamber, 4 mm.

5339. *Ammonites* gen. et spec. indet.

Two imperfect specimens of young individuals of possibly a species of *Stepheoceras*. The better specimen of the two, that figured, is 18 mm. in diameter, shows 4 convolutions, the outermost of which is 9.8 mm. wide and 6.4 mm. high, and has the surface strongly ribbed. The ribs are rounded and every second or third rib carries two knobs on the latera. On the

ventro-lateral angles the ribs bifurcate and their branches are continuous with low convex curves across the slightly flattened venter.

5340. **Rhynchonella cf tetraëdra** Sowerby.

Quenstedt, 1858, Jura, pl. 22, figs. 11, 12.

Davidson, Brit. Foss. Brach., i., pl. xviii., figs. 5-9.

A single ventricose senile individual, referred provisionally to this species, has a length of 30 *mm.*, width 38 *mm.*, and height of 30 *mm.* at two thirds the length of the shell.

5341. **Rhynchonella cf quadriplicata** Zieten.

Davidson, Brit. Foss. Brach., iv., p. 201, pl. xxix., figs. 1-3.

A single, much exfoliated specimen in our collection from Mejdell Shems seems to agree specifically with the individuals illustrated by Davidson's figures 1 and 3 mentioned above, the originals of which are from the Inferior Oolite of England. Our specimen differs from those figured, in that it has a slightly higher beak on the ventral valve. Its dimensions are: height, 33 *mm.*; width, 32.3 *mm.* at two thirds of its length; thickness, 21 *mm.* at one half of its length.

CRETACEOUS FOSSILS FROM JERASH TO EL REMAMIN
ROUTE

A. Echinoid beds, of the "glandarius zone" of Fraas and other writers on Syrian geology, and considered by Fraas to be of lower Cenomanian horizon.

5342. **Apiocrinus? sp?**

A worn fragment of a crinoid column, having a length of 20 *mm.* and diameter of 10 *mm.*, with the joints averaging 2 *mm.* in length, appears to be referable to some species of *Apiocrinus*.

5343. **Cidarites glandarius** Lang.

Cidarites glandarius authentica Quenstedt, Petref. Deutschl. Echinodermen, Taf. 68, figs. 53-58, 62-64.

Cidarites glandarius Fraas, Aus dem Orient, ii., p. 27, pl. i., figs. 2-10.

Spines of Cidarites Conrad. Lynch, Exped., p. 212, pl. i., figs. 3-5.

These solid club-shaped echinoid spines from Syria are to be found in nearly all palæontological museums. There are eleven specimens in the Libbey collection, which present all variations of form and ornamentation illustrated by Quenstedt's and Fraas's figures cited above.

5344. ***Cidarites glandarius claviphœnix*** Fraas.

Fraas, *Aus dem Orient*, ii., p. 29, pl. i., fig. 11.

Among our cidarite spines is one specimen that closely resembles the figure cited above and referred by Fraas to *C. glan. claviphœnix* of Quenstedt. Fraas's figure shows a smooth surfaced spine, which in our opinion is nothing but a water-worn specimen of the slightly tuberculate type to which Quenstedt gave the varietal name of "*claviphœnix*." Our specimen is about two thirds the size of that shown in Fraas's figure, and ours certainly owes its smooth surface to water erosion, for traces of its original minutely reticulate and tuberculate ornamentation can be seen at certain less-worn portions of its surface.

5345. ***Cidarites glandarius claviphœnix*** Quenstedt.

Quenstedt, *Petref. Deutschl. Echin.*, pl. 68, figs. 46-48.

Six specimens of obovate spines, the surfaces of which are quite smooth below, are referred to this variety. Scarcely any constriction at the neck differentiates this variety from the typical *glandarius*. The ornamentation also varies. Tubercles are absent from the lower third of the surface, where the ornamentation consists of delicate reticulated raised lines. The tubercles appear as small points at the top of the lower third, increase in size, and coalesce to form delicate ridges which converge radially to the centre of the distal end of the spine.

B. Pelecypod fauna in soft cream to light buff chalky limestone, collected en route from Jerash to El Remamin. Cretaceous in age.

5346. ***Cardium cf pauli*** Coquand.

Lartet-Luyes, *Expl. Géol. Mer Morte*, p. 131, pl. xi., figs. 1-2.

A single fairly perfect internal cast is referred to this species. Its dimensions are: length, 44 *mm.*; height, 43 *mm.*; thickness, 27 *mm.*

5347. **Pholadomya syriaca** Conrad.

Conrad, in Lynch, 1852, Exped. Dead Sea, etc., p. 231, Appendix, pl. 2, fig. 17.

A single imperfect internal cast is referred to Conrad's species.

5348. **Plicatula reynesi** Coquand.

Lartet-Luynes, Expl. Géol. Mer Morte, p. 137, pl. xi., figs. 21, 22.

Four imperfect specimens correspond to the figures and description of this species given by Lartet.

5349. **Pecten** sp ?

An undeterminable fragment of the central portion of outer surface of a valve.

5350. **Gryphæa marcoui** Hill and Vaughan.

Hill and Vaughan, 1898, Bull. 151 U. S. G. S., pp. 50-53, pls. ii.-v.
Gryphæa pitcheri Fraas, Aus dem Orient, ii., p. 86.

The Libbey collection contains eleven specimens which conform in all respects with the descriptions and figures of *Gryphæa marcoui* from the Texan Cretaceous published by Hill and Vaughan. The Texan originals are from the Fredericksburg division of the Lower Cretaceous. Length, 45 *mm.*; width, 34 *mm.*

5351. **Serpula** sp ?

Attached to the shell of one of the specimens of *Gryphæa marcoui* is the winding tube of a serpulid annelid, the surface of which is so worn as to render its characters undeterminable.

5352. **Gryphæa mermeti** Coquand.

Lartet-Luynes, Expl. Géol. Mer Morte, pl. ix., figs. 4-13.
Lartet, Ann. Sci. Géol., iii., pl. 10.

Two water-worn specimens are referred to this species.

5353. **Gryphæa mermeti sulcata** Lartet.

Lartet-Luynes, Expl. Géol. Mer Morte, pl. 9, figs. 10, 11.

Lartet, Ann. Sci. Géol., iii., pl. 10, figs. 14, 15.

A single water-worn specimen showing traces of radial ribs may be referred to this variety.

5354. **Holectypus larteti** Cotteau.

Cotteau, 1869, Bull. Soc. Géol. France [2], vol. xxvi., p. 537, figs.

Lartet-Luynes, Expl. Géol. Mer Morte, p. 155, pl. xiv., figs. 1-3.

? *Echinus libanensis* Conrad, 1852, Lynch, Exped., p. 235, pl. 8, f. 54.

A single imperfect specimen is referred to the species illustrated by Lartet. Length, 26 mm.; width 26 mm.; height 14.5 mm.

5355. **Venus (?) sp.**

An apparently perfect shell is found on close examination to have the umbonal regions crushed so that the beaks appear to be strongly incurved over the cardinal margin. The characters of lunule and posterior area are disguised and hinge invisible. An internal mould of a Venus-like pelecypod which occurs in the collection is too imperfect for identification.

Length of entire specimen, 49 mm.; height, 46.5 mm.; thickness of both valves, 26 mm.

CRETACEOUS FOSSILS FROM KERAK

A. Gastropod fauna of the blue chert with chalky limestone partings. Age—Senonian?

5356. **Turritella seetzeni** Lartet. (Plate A, Fig. **D**; Plate B, Figs. 1 and 3; Plate C, Fig. 7.)

Lartet, 1872, Ann. Sci. Géol., iii., p. 43, pl. 9, figs. 9, 10.

Lartet-Luynes, 1877, Expl. Géol. Mer Morte, p. 120, pl. xii., figs. 15, 16, 16e.

This species is abundantly represented on the surfaces of the blocks of chert in our collection, a condition well illustrated by our Fig. **D** of Plate A. Lartet's figures and description give the species only two keels; "one median, the other near the anterior suture." Our numerous specimens

show that the species has a smooth surface during its younger stages, two delicate keels are acquired simultaneously on the second whorl, a third keel appears on the third whorl between the median keel and the anterior suture, and a fourth keel is visible only on the basal whorl on which it continues the line of the suture. The shell illustrated by Fig. 7 of Plate C has a length of 30 *mm*, basal width of 10 *mm*., and the basal whorl is 7 *mm*. high.

5357. **Turritella reyi** Lartet. (Plate B, Figs. 1 and 3.)

Lartet, 1872, Ann. Sci. Géol., iii., p. 43, pl. 9, figs. 13, 14.

Lartet-Luynes, Expl. Géol. Mer Morte, p. 122, pl. xii., figs. 21, 22.

This unicarinate species is common though not so abundant as the foregoing species. The two specimens shown on the block of chert figured are respectively 15.5 and 27.3 *mm*. in length.

5358. **Natica orientalis** Conrad. (Plate B, Fig. 3.)

Conrad, 1852, Lynch, Exped. Dead Sea, Appendix, p. 233, pl. 5, f. 41.

Compare "*Natica sp.*," Lartet, Ann. Sci. Géol., iii., p. 35, pl. 10, f. 3.

Compare "*Natica sp.*," Lartet-Luynes, Expl. Géol. Mer Morte, p. 117, pl. xii., figs. 17, 18.

Two specimens of a species of *Natica*, having the strongly impressed sutures described and figured by Conrad, are attached to the surface of the block of chert illustrated by Fig. 3 of Plate B. The form of the aperture and basal portion of the shell cannot be seen in our specimens. The dimensions of the larger of the two are: Length 11.5 *mm*., basal width 9 *mm*., height of last whorl 8.5 *mm*.

5359. **Cerithium kerakense** sp. nov. (Plate C, Fig. 10.)

Cf. "*Cerithium? nov. sp.*" Lartet, Ann. Sci. Géol., iii., p. 38, pl. x., figs. 4, 5, from the chert of the Moabite plateau at Schihan.

Shell with elongated conic spire, with seven evenly rounded whorls all of which are ornamented with strong rounded longitudinal ridges and with fine sharp spiral ribs that form crescentic imbricated crests where they cross the summits of the ridges. The aperture is not visible as the shell is partly imbedded in

the chert matrix. Dimensions: Length 9 *mm.*, width of basal whorl 5 *mm.*, height of basal whorl 3.2 *mm.*, four longitudinal ridges in 2 *mm.*, and 5 spiral lines in 2 *mm.* on basal whorl. The species is represented by one fairly well preserved and by another fragmentary specimen on the surface of a chert block.

5360. **Bulla (Haminea) kerakensis** sp. nov. (Plate B, Fig. 3.)

A small subglobular elliptical shell with thick porcellaneous walls. The aperture is considerably longer than the axis of the shell and its anterior and posterior margins flare broadly, while its lateral margin is nearly straight and slightly thickened. The columellar margin is thickened, and lies to the right of or outside of the axis of the shell and is parallel to it. The base is minutely perforated. Spire impressed. Surface marked by numerous delicate sharply impressed spiral lines which are scarcely distinguishable on the upper and outer portions of the shell but become very apparent toward the basal portion. Our species resembles *Haminea lamarckii* Deshayes, 1864 (Descr. Anim. sans Vert., vol. ii., p. 641, pl. 40, figs. 25-28) from the Calcaire Grossier of the Paris basin Eocene, but has a slightly more oblique body whorl and a wider aperture.

Dimensions: Length 2.8 *mm.*, width at middle 1.8 *mm.*, width of aperture 0.7 *mm.*, height of inner whorl at columellar lip 1.8 *mm.* Another individual the aperture of which is imbedded in chert has a length of 3.0 *mm.* and a width of 1.8 *mm.*

Only two specimens of this shell are in hand, both of which are attached to the surface of the chert block figured on Plate B.

5361. **Scalaria goryi** Lartet. (Plate C, Fig. 13.)

Lartet, 1872, Ann. Sci. Géol., iii., p. 44, pl. 10, figs. 6, 7.

Lartet-Luynes, Expl. Géol. Mer Morte, p. 123, pl. x., figs. 20 a and b.

Two imperfect specimens of this species are found on the blocks of chert from Kerak.

5362. **Dentalium hexagonum** sp. nov. (Plate B, Figs. 1 and 2; Plate A, Fig. *B*.)

Shells of a species of *Dentalium* are common in association with *Turritella seetzeni* on the surfaces of chert blocks from Kerak. They seem to represent a new species, the characters of which are as follows. Shells elongated, slightly curved, cylindrical in section; smooth in nepionic (young) stages, hexagonal in neanic (adolescent), and again irregularly rounded in ephebic (adult) stages. The posterior extremity of the shell is not seen on any of our specimens. Several specimens show the perfectly smooth nepionic stage. The neanic stage is marked by the assumption of six sharp equidistant longitudinal carinæ associated with crowded irregular normally transverse growth lines, which often become transverse ridges. In the adult the longitudinal carinæ quite disappear and the transverse rings often become very prominent. Length 35 mm., maximum width 2.9 mm.

5363. **Melania kerakensis** sp. nov. (Plate C, Figs. 5 and 6.)

Among the residual material obtained by digesting some of the chalky limestone from Kerak in hydrochloric acid were found several young and adult specimens of a turretted gastropod which appear to represent a species of *Melania*. As nothing resembling it is described or illustrated in the literature at our command, we have decided to present it as a new species. Its characters are as below.

Shell with depressed conic turretted spire with an angle of about forty degrees. The whorls are five to six in number. Of these the two apical whorls are rounded and smooth; the lowermost three or four rounded and carinated. The carinæ of the basal whorls are three, in the form of subacute spiral ribs. The upper primary carina is the most prominent and is situated at the median line of the whorl and has its crest studded with short flattened spines. The two carinæ occupying the lower halves of the basal whorls are less prominent, narrower keels without spines. The lowermost keel, marking the extension of the suture line, is visible only on the basal whorl;

while the median keel appears first on the fourth whorl and occupies a median position between the third and the primary keel. The area between the suture and the primary keel is slightly tumid; the other intervals are concave. The base of the shell is tumid and there is a minute umbilicus. The aperture is subcircular, the lip apparently thin and entire. Length about 8 *mm.*, width of basal whorl 5 *mm.*, height of aperture 3 *mm.*

5364. **Turritella cf maussi** Lartet.

Expl. Géol. Mer Morte, p. 122, pl. xii., figs. 12, 13.

Several imperfect casts of a small *Turritella* with elongate spire and rounded whorls are referred to this species.

5365. **Baculites asper** Morton. (Plate A, Fig. A; Plate B, Fig. 3; Plate C, Fig. 11.)

Roemer, 1852, Kreide Texas, pl. ii., f. 2.

Lartet, 1872, Ann. Sci. Géol., p. 35, pl. 9, f. 2.

Lartet-Luynes, 1877, Expl. Géol. Mer Morte, p. 115, pl. viii., f. 7.

On the slabs of chert from Kerak are seen several badly crushed fragments of a species of *Baculites*, which appears to be identical with that described and figured by Lartet. Lartet's examples were from the "compact limestone which forms the Seuil de l'Arabah (Arabia Petræa) and from the western margin of the Dead Sea." Among the silicified material released by digestion of the slabs in acid were found two fragments of the younger portions of the shells of this species, both of which show the sutures in neanic stages of development. The better of these is illustrated by Figure 11 of Plate C.

5366. **Sphenodiscus? sp?** (Plate C, Figs. 8 and 9.)

Two fragmentary specimens of a species of *Sphenodiscus* are in our collection. One (Pl. C, Fig. 8) is a badly crushed probably mature individual on the face of a block of chert. The shell is 45 *mm.* high, with smooth surface, sharp ventral keel, and small umbilicus. The only visible traces of the suture are on the last whorl, where they show the first and

second lateral saddles to be subcircular and entire, and the corresponding lobes to be slightly phylliform.

The other specimen is a silicified fragment representing probably the young of this same species. The protoconch and the first whorl and outer half of the second volution are preserved (Pl. C, Fig. 9). The sutures show on the outer half of the second volution, but cannot be distinguished on the first volution. At the completion of the second volution there are four rounded short lateral lobes and as many entire open shallow saddles, and the same shape is maintained in the succeeding four sutures. Form of ventral lobe not discernible. Diameter at second volution 7 *mm.*, width of whorl 1.8 *mm.*

5367. **Corbula olivæ** Whitfield.

Bull. Amer. Mus. Nat. Hist., vii., p. 413, pl. vii., figs. 19-21.

A few fragmentary specimens showing the enrolled umbones and strongly costate anterior portions of the right valves of this species were recognized protruding from the surface of blocks of chert. One may be distinguished near the edge of the block carrying *Turritella reyi* (Plate B, Fig. 3).

5368. **Arca sp?** (Plate B, Fig. 3.)

A number of small shells of a species of *Arca* 3 to 5 *mm.* long are attached to the surface of the block of chert upon which are several of the species mentioned above. The cardinal area appears to be smooth, with a distinct slightly depressed triangular median area. The hinge characters and interior are wholly unknown.

5369. **Venus sp?** (Plate A, Fig. C; Plate B, Figs. 1 and 3.)

Upon the surface of the same block carrying *Arca*, *Bulla*, *Turritella*, etc., are several crushed valves of a thin shelled, concentrically costate species of *Venus*, the hinge and interior characters of which are quite unknown.

5370. **Leda grovei** Lartet, 1877.

Lartet-Luynes, 1877, Expl. Géol. Mer Morte, p. 127, pl. xii., f. 17.

The hinge of a species of *Leda*, which may be identical with

the species cited, protrudes from the surface of a chert block. The outline of the shell can be traced, but its form is disguised by its crushed condition.

The association of species noticed on our blocks of chert from Kerak is quite similar to that indicated by Lartet as occurring on his "Silex de Schihan." This resemblance is well shown by a comparison of his Figure 7 of Plate XII. with the photograph of a Kerak block reproduced on our Plate B, Figure 3.

B. Oyster bank specimens from vicinity of Kerak:

5371. *Ostræa cf flabellata* d'Orbigny.

Lartet-Luynes, Expl. Géol. Mer Morte, p. 146, pl. x., figs. 10-13.

The shells of which these oyster bank cherts are almost wholly composed represent two species of *Ostræa*. One of them, referred to the above species, is a thin shelled strongly plicate form, of which fragmentary specimens only can be recognized.

5372. *Ostræa olisoponensis* Sharpe.

Lartet-Luynes, 1877, Expl. Géol. Mer Morte, p. 138, pl. ix., figs. 1-3.

This is a thick-shelled sparingly nodulate but otherwise smooth species, of which a few specimens can be distinguished among the crushed agglomerate of the oyster bank chert.

Both of these species of *Ostræa* are recorded by Lartet from the vicinity of Kerak.

NOTES ON SANDSTONE FROM THE VICINITY OF PETRA

5373. A number of pieces of very friable loosely cemented reddish brown sandstone show well developed cross bedding. The color varies from a dominant reddish brown to blue-gray and purplish tints which occur locally in small portions of the rock. Digestion in hydrochloric acid dissolves the iron salts and an apparently small amount of calcareous cement with slight effervescence, and leaves as a residue a warm cream-colored

loose quartz sand with very little quartz flour, and apparently no aluminous silt. The grains average 0.2 to 0.3 *mm.*, with some larger of 1.0 to 1.5 *mm.*, and scattered through the rock are numerous small rounded pebbles of 2.0 to 6.0 *mm.* diameter. Many of the grains appear to be rounded. Examination in glycerine under the polarizing microscope shows that the original nuclear grains of detrital quartz are all of marked angular form, and that such rounding as occurs is due to the accidental form assumed by the coating of secondarily deposited quartz, a considerable amount of which has been received by each original nuclear grain. This coating shows as a covering of minute pyramidal points, many of which show fairly large brilliant crystalline faces. No accessory minerals are detected in this sand, beyond the hydrous iron oxides of the cement. No magnetite occurs.

The absence of accessory minerals indicates that this sand has been transported far from its point of origin without admixture of additional material along the way, or that it represents the debris from a region of chert-bearing limestone rocks. The angular form of the original grains suggests water as the transporting agent, for the size of the nuclear grains of sand is below the minimum limit of rounding by attrition in water and at the same time well above the minimum for æolian attrition. The absence of small rounded nuclear grains indicates that during its transportation this sand has at no time received accretions from desert or pseudodesert areas (river dunes). It does not conform to the characters of those pure quartz sands of marine origin which I have examined, for these latter all show a goodly proportion, often very large, of well-rounded wind-worn grains, due to the fact that they are accumulated well out upon the barrier bars, far from the sources of their component elements, where the winds, rather than the waves, have been the dominant factor in wearing them down to their small grains and giving these grains their ground-glass surface.

I conclude therefore that this specimen represents a river or stream sand deposited either in an old river channel or in a lake or sea in close proximity to a stream mouth. There is

also a strong possibility that this sand may be the result of erosion of the cherty limestones of Cretaceous age which form such a large bulk of the plateau to the eastward of the Jordan and Dead Sea valleys. Some of the largest grains are of milky quartz but their identity with the chert of the Cretaceous cannot be demonstrated at present. The secondary deposit of silica precludes the possibility of the sandstone from which the sample was obtained being of recent origin, and points at least to a Pliocene or older Tertiary age for the beds.

5374. A piece of peculiarly mottled purplish sandstone is illustrated by Figure 12 of Plate C. This rock is made up of lenticles of cream-colored quartz sand varying from 7 to 16 *mm.* in length and 2 to 5 *mm.* in thickness, separated by undulating films of purplish iron-stained sand about 1 to 1.5 *mm.* thick. On digestion the iron stain disappears, there is slight effervescence, and a cream-colored slightly coherent residue remains. This readily falls under pressure into sand, and rock flour. The sand has grains of 0.1 to 0.5 *mm.* and some as large as 1.0 *mm.* in diameter, and forms about fifty-eight per cent. of the mass. The fine rock flour forms about twelve per cent. by weight. The remaining thirty per cent. probably consisted of the iron and calcareous cement with a small amount of fine silt lost during decantation. The small grains are all sharply angular, the larger ones are rounded. All the grains show angular nuclei, and a coating of secondary silica with crystalline facets in abundance. A considerable number of accessory minerals are present, all in minute grains varying from 0.1 to 0.3 *mm.* in diameter, and all of these have their angles worn. Red garnet, a dark green barely translucent mineral which may be pyroxene, olivine, zircon, some magnetite, and minute flakes of muscovite were recognized.

The peculiar structure of the sample suggests dune rather than subaqueous origin. The presence of the rock flour, the small size of the grains, and the rounded form of those between .5 and 1.0 *mm.* confirm this suggestion, and the presence of the accessory minerals in minute grains is not incompatible with this mode of dune origin.

5375. A hand specimen of compact fine grained brown sandstone has its grains cemented by iron and silica. Prolonged digestion in acid failed to remove the brown iron stain or cement and the sample could not be broken down without extreme crushing. Accordingly it could not be examined by the same methods adopted for loose sands. However, microscopic examination of the weathered surface shows that the component quartz grains have the same size and the same secondarily deposited quartz as described under No. 5373, and it is probable that this sample represents a bed of the latter in which the secondary silica has been deposited to such an extent as to render the rock practically a compact quartzite.

PRINCETON UNIVERSITY, April 4, 1905.

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PLATE A

Slab of Senonian? cherty limestone from the vicinity of Kerk, Syria, carrying an abundance of gastropod shells. The majority are individuals of *Turritella setacea* (D). Others are A—*Baculites* asper; B—*Dentalium hexagonum*; C—*Venus* sp.?

PLATE A

Slab of Senonian? cherty limestone from the vicinity of Kerak, Syria, carrying an abundance of gastropod shells. The majority are individuals of *Turritella seetzeni* (D). Others are *A*—*Baculites asper*; *B*—*Dentalium hexagonum*; *C*—*Venus* sp?.

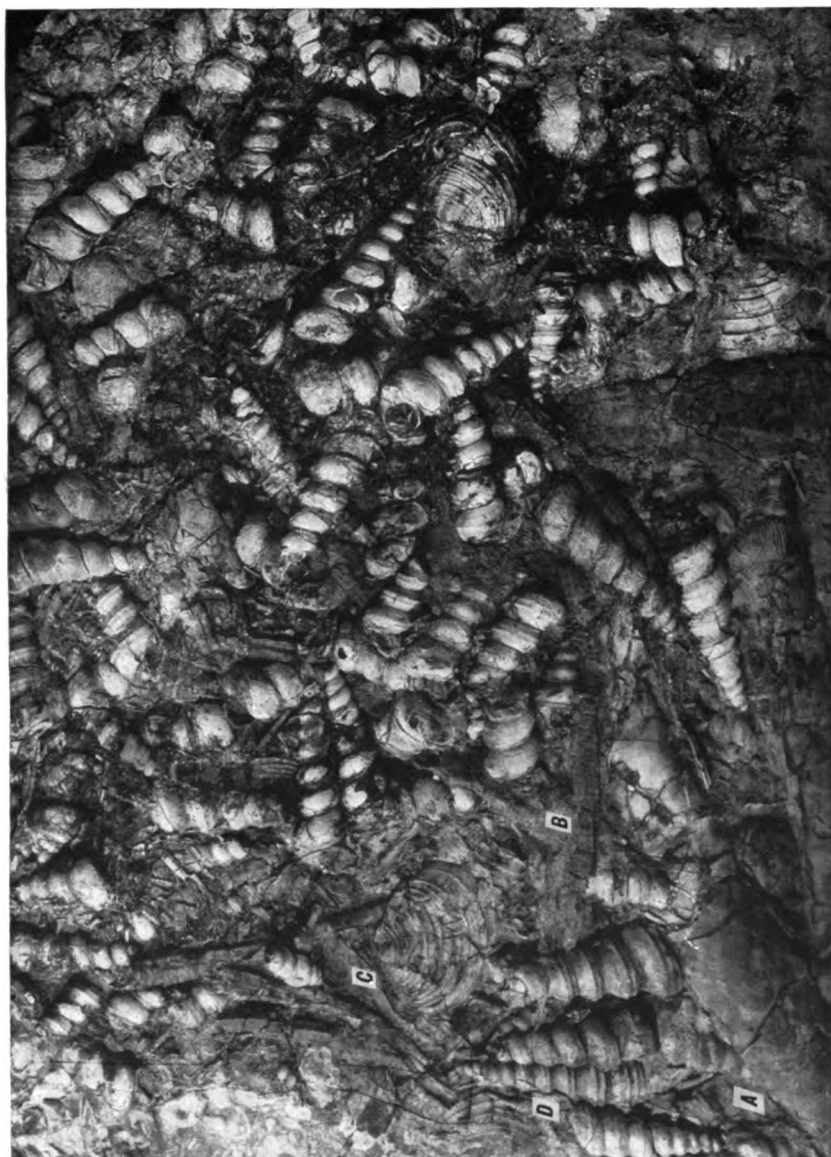


PLATE A

Figure 1. Slab of Kerak chert with individuals of *Dentalium hexagonum* (5362) and *Turritella veyi* (5357). Slightly enlarged; length of the longest *Dentalium* shell is 35 mm.

Figure 2. Cross section of *Dentalium hexagonum* to show hexagonal section of shell during neanic stage. Diameter of original is 2.7 mm.

Figure 3. Slab of cherty limestone from Kerak, bearing gastropods, pelecypods, and cephalopods. 5356—*Turritella* section; 5357—*Turritella veyi*; 5358—*Natica ornata*; 5360—*Bulla kerakensis*; 5362—*Baculites* sp.; 5367—*Corbula olivacea*; 5368—*Clava* sp.; 5369—*Nassa* sp. Length of the central numbered individual of *Turritella veyi* is 12.5 mm.

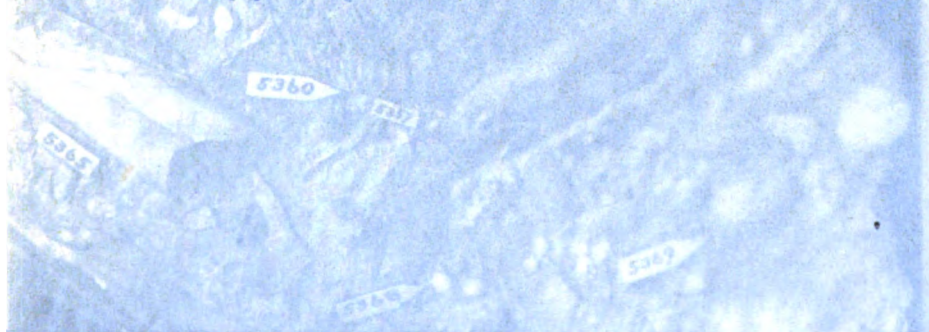
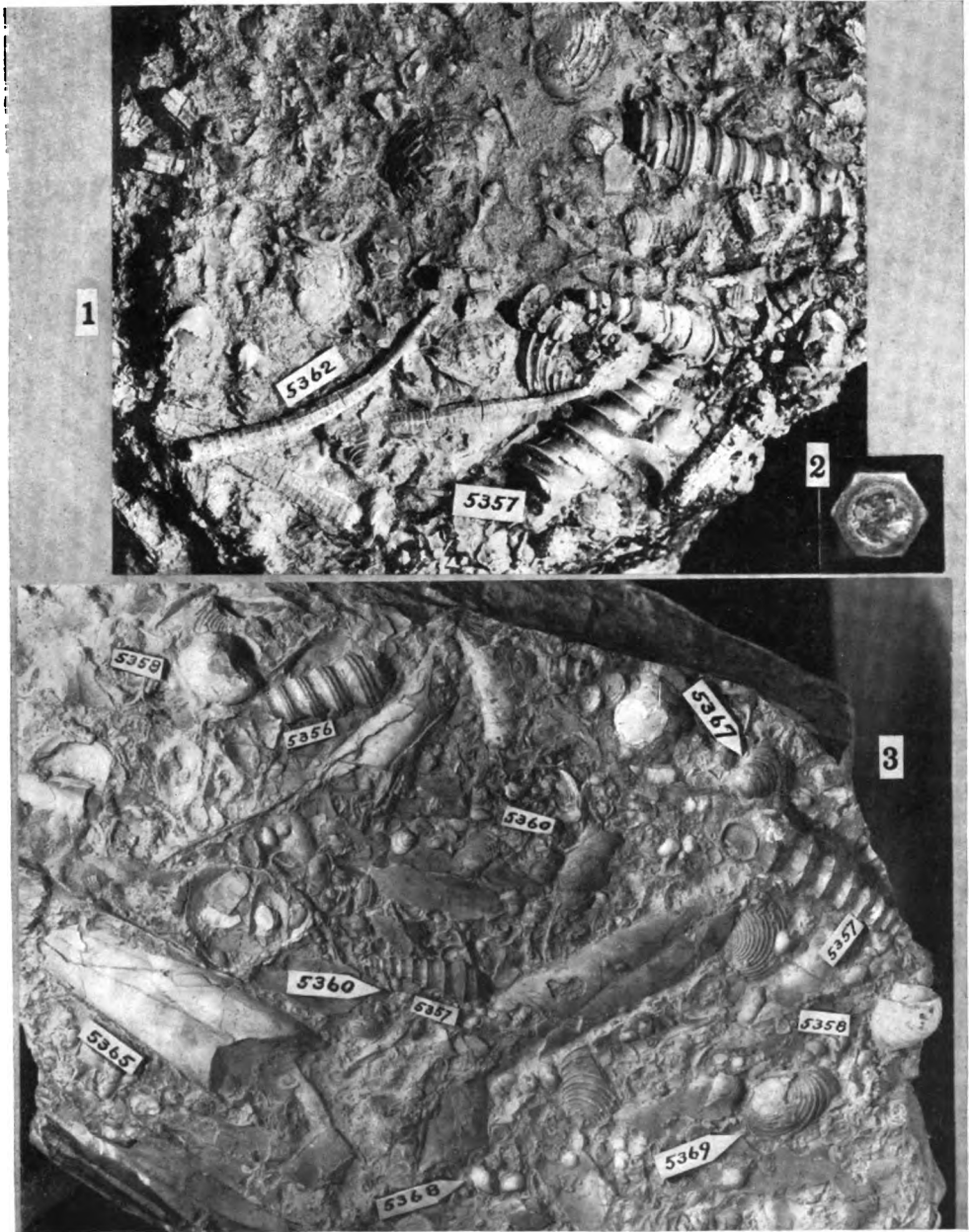


PLATE B

Figure 1. Slab of Kerak chert with individuals of *Dentalium hexagonum* (5362) and *Turritella reyi* (5357). Slightly enlarged; length of the longest *Dentalium* shell is 35 mm.

Figure 2. Cross section of *Dentalium hexagonum* to show hexagonal section of shell during neanic stage. Diameter of original is 2.7 mm.

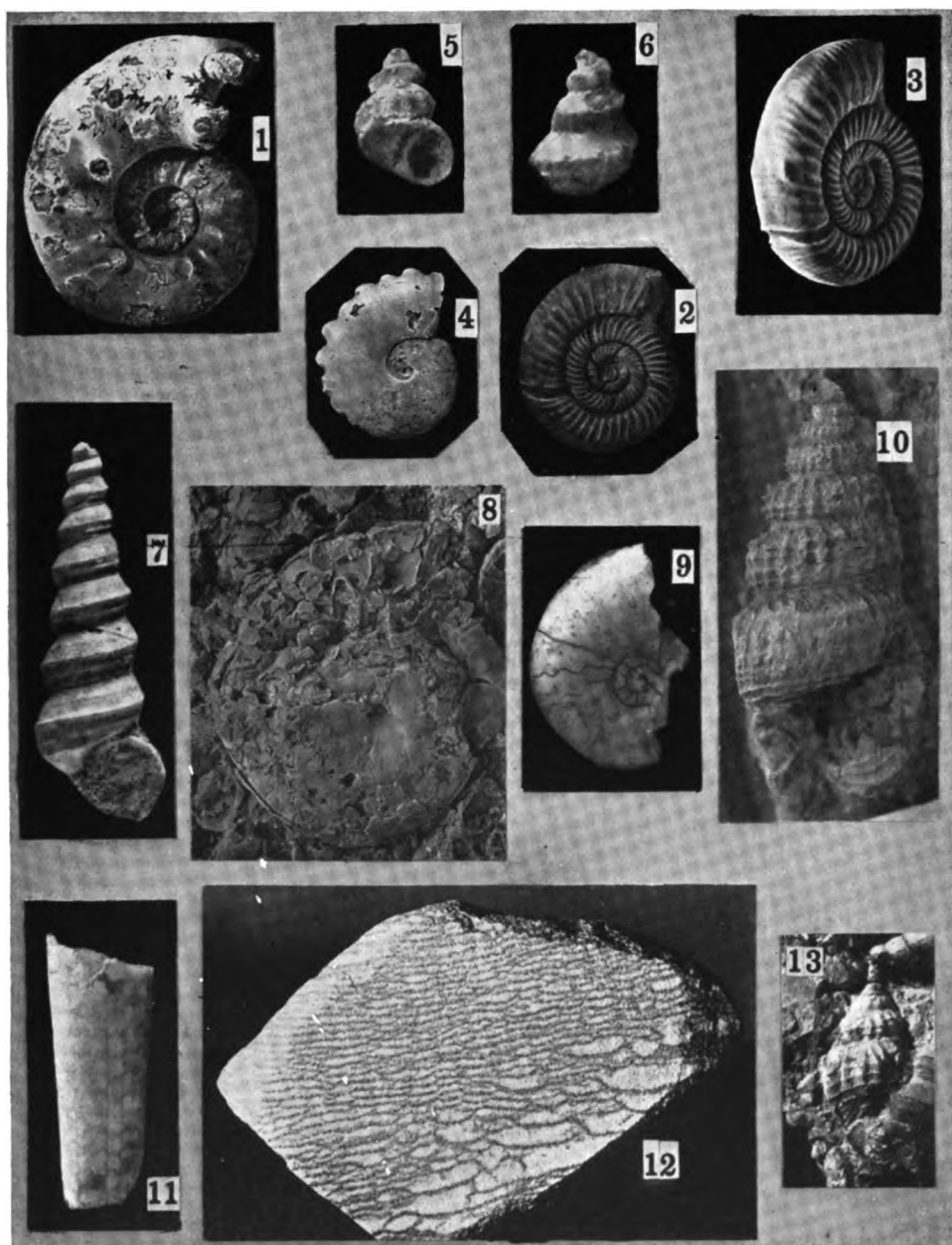
Figure 3. Slab of cherty limestone from Kerak, bearing gastropods, pelecypods, and cephalopods. 5356—*Turritella seetzeni*; 5357—*Turritella reyi*; 5358—*Natica orientalis*; 5360—*Bulla kerakensis*; 5365—*Baculites asper*; 5367—*Corbula olivæ*; 5368—*Arca* sp?; 5369—*Venus* sp?. Length of the central numbered individual of *Turritella reyi* is 15.5 mm.



- Figure 1. *Aspidoceras pervanatum*. Lateral view of specimen No. 5336. Longest diameter is 42 mm. Jurassic; Mejdel Shems, Syria.
- Figures 2, 3. *Perrinites convolutus* *conv.* Lateral view and three-quarter view of specimen No. 5337a to show the apertural lappet scars. Longest diameter is 26 mm. Jurassic; Mejdel Shems, Syria.
- Figure 4. *Crematoceras kerkassan*. Lateral view of specimen No. 5338, the longest diameter of which is 23 mm. Jurassic; Mejdel Shems, Syria.
- Figures 5, 6. *Melchioria kerkassan*. Front and back views of two specimens of No. 5363, with lengths of about 8 mm. Senonian? chert limestone near Kerkak, Syria.
- Figure 7. *Turritella scabra*. Front view of best specimen, having length of 30 mm. Senonian? chert of Kerkak, Syria.
- Figures 8, 9. *Sphenodiscus*? sp.? Figure 8—Adult specimen, 45 mm. high, showing traces of sutures on outermost half of last whorl. Figure 9—Young individual of same species, with height of 7 mm., showing form of sutures at completion of second convolution. Senonian? chert of Kerkak, Syria.
- Figure 10. *Cerithium kerkassan*. Apertural view of shell, attached to surface of chert block, having length of 9 mm. Senonian? chert of Kerkak, Syria.
- Figure 11. *Baculites asper*. Fragment, 18.3 mm. long, of neanic stage of shell. Senonian? chert of Kerkak, Syria.
- Figure 12. Cross section of block of "Nubian sandstone", specimen No. 5354, from Petra, Syria. Length of original is 94 mm.
- Figure 13. *Scleraxis goryi*. Back view of shell imbedded in face of chert block of Senonian? age from Kerkak, Syria. Length of shell is 6 mm.

PLATE C

- Figure 1. *Aspidoceras perarmatum*. Lateral view of specimen No. 5336. Longest diameter is 42 mm. Jurassic; Mejdal Shems, Syria.
- Figures 2, 3. *Perisphinctes convolutus evexus*. Lateral view and three-quarter view of specimen No. 5337a to show the apertural lappet scars. Longest diameter is 26 mm. Jurassic; Mejdal Shems, Syria.
- Figure 4. *Creniceras renggeri*. Lateral view of specimen No. 5338, the longest diameter of which is 23 mm. Jurassic; Mejdal Shems, Syria.
- Figures 5, 6. *Melania kerakensis*. Front and back views of two specimens of No. 5363, with lengths of about 8 mm. Senonian? cherty limestone near Kerak, Syria.
- Figure 7. *Turritella seetzeni*. Front view of best specimen, having length of 30 mm. Senonian? chert of Kerak, Syria.
- Figures 8, 9. *Sphenodiscus?* *sp?* Figure 8—Adult specimen, 45 mm. high, showing traces of sutures on outermost half of last whorl. Figure 9—Young individual of same species, with height of 7 mm., showing form of sutures at completion of second convolution. Senonian? chert of Kerak, Syria.
- Figure 10. *Cerithium kerakense*. Apertural view of shell, attached to surface of chert block, having length of 9 mm. Senonian? chert of Kerak, Syria.
- Figure 11. *Baculites asper*. Fragment, 18.3 mm. long, of neanic stage of shell. Senonian? chert of Kerak, Syria.
- Figure 12. Cross section of block of "Nubian sandstone," specimen No. 5374, from Petra, Syria. Length of original is 94 mm.
- Figure 13. *Scalaria goryi*. Back view of shell imbedded in face of chert block of Senonian? age from Kerak, Syria. Length of shell is 6 mm.



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